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COUNCIL OF MINISTERS

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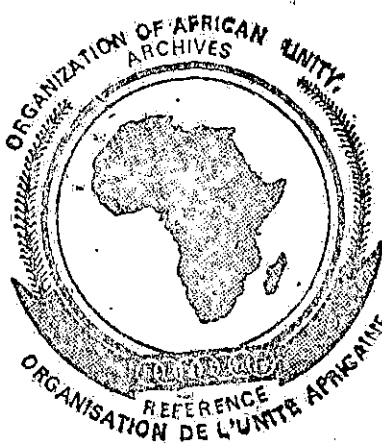
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REPORT OF THE SECRETARY-GENERAL ON THE
FOURTEENTH MEETING OF THE INTERNATIONAL SCIENTIFIC
COUNCIL FOR TRYPANOSOMIASIS RESEARCH AND CONTROL (ISCTRC)
DAKAR, SENEGAL 15 - 17 APRIL 1975

REPORTS AND RECOMMENDATIONS



CM 813

MICROFICHE

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Trypanosomiasis in Man

Rapporteurs: S.E. Emu
M. Ouoba

Relatively very few papers were presented on the item "Trypanosomiasis in Man." This in no way reflects the relative importance that P. de Raadt attached to the disease in his review of diagnosed cases of trypanosomiasis between 1968 and 1973. He demonstrated that trypanosomiasis is still fatal and wide-spread in Africa.

T. Ogada and D. Mbwabi discussed the recent state of human trypanosomiasis in the Teso, West Akoli, Madi and West Nile regions of Uganda. These regions are situated North-West of Uganda and are bordered in the North by Sudan and in the West by Zaire. The authors conducted a regional historical survey on sleeping sickness which first appeared in Samliki Valley in 1896 and on its spread in the 1920's and 1930's. The control measures consisted in the clearing of bushes and the treatment of diagnosed cases. They stressed the studies carried out by the EATRO between 1968 and 1972. Eleven cases were diagnosed from among 1,777 persons examined. However, this figure is believed to have been under-estimated and there is fear of an epidemic. International cooperation among the neighbouring countries has been strongly recommended in order that steps can be taken to fight trypanosomiasis and tse-tse flies in that region.

TEMU and NJOGU demonstrated that Berenil which was introduced in veterinary science in 1955 has been used with success against *T. gambiense* in West Africa (Hutchinson and Watson; 1962) and against cases of sleeping sickness only in their early stages and *T. rhodiense* in East Africa. Experiments in EATRO in early 1960 have shown that this product is well tolerated and is non-toxic. A 5mg/kg x 3 dose, standardized since 1966, was adopted by EATRO in the treatment of early cases of human trypanosomiasis. The 57 cases treated between January 1967 and December 1973 were successful, with the exception

of two relapses. The authors believe that I M Bernenil is preferable to I.V Suramin in the treatment of early cases of trypanosomiasis in man because it is non-toxic, easy to administer and requires a shorter period of hospitalization.

A lively discussion on "Relapse" versus "Reinfection" of sleeping-sickness concluded that a fair means of assessing the extent of the disease and its relapse can be obtained only through parasitological and serological tests and clinical and CSF researches.

J.L. FREZIZ and J. CARRIE observed that the detection of parasites in the body fluids is an indisputable sign of trypanosomiasis. When the parasites have not been discovered, immunity tests including IgM and FCI are useful. The authors stress the fact that the FCI is more indicative than the IgM. The other methods of diagnosis mentioned are: column separation by means of DEAE - cellulose, inoculation of animals likely to be affected and xenodiagnosis.

It is recommended that research should be carried out on all infested areas using IgM and FCI tests followed by parasitological diagnostics or column separation on cellulose. Positive cases must be treated. Entomological studies and the eradication of Glossina will guarantee satisfactory results.

In his paper on relatively high incidence of human trypanosomiasis in the Lake Kainji district in Nigeria, ADEKOLU JOHN mentioned the possibility of future epidemics with the presence of G. palpalis and G. tachionoides in that district where a dam is being constructed. So far no case of sleeping sickness has been reported.

An observation on the epidemiology of a recently infested area has revealed the existence of two residual infested areas in the Estuary and coastal areas of Ougoue in Gabon. These residual areas, at present less active, constitute nonetheless a permanent threat to the people of the anti-tse-tse fly campaign is relaxed or if the movement of these flies is not controlled.

This danger is due to the following factors:

- i) weak symptomatic indications for diagnostics,
- ii) biannual chemo-prophylaxis which has become undesirable, and
- iii) the difficulty in carrying out systematic detection in the Libreville region.

Public Health Experts have confirmed the inadequacy of the current methods of fighting trypanosomiasis and the need to improve clinical and parasitological diagnostics which could be rendered effective if coupled with immunological techniques.

RECOMMENDATIONS

Although few papers on Human Trypanosomiasis were presented to the Council, it has nevertheless been observed that trypanosomiasis is still widespread on the entire African Continent. The Council noted that the ideal method of fighting tse-tse flies was their eradication which would result in the eradication of the disease in both man and animals. However until this has been done, the Council felt the need to develop the methods of diagnosis and the chemo-therapeutic weapons in the fight against trypanosomiasis in Man. The Council appealed to the goodwill of all African countries or friends of Africa to provide moral and material support for the attainment of this objective and RECOMMENDS that:

1. The distribution maps of infested areas be kept up-to-date;
2. Control of infested areas through medical investigation, aided by the conventional immunological methods of diagnostics be made effective and popular as soon as possible.
3. A well-co-ordinated action be carried out by African governments to set up a joint anti-trypanosomiasis campaign.

TRYPANOSOMIASIS IN ANIMALS

Rapporteurs: P.M. Mwambu
P. Leeflang

This subject is covered by sixteen papers of which nine were read and discussed. The remaining will be published together with the other deliberations of this meeting.

Dr. FINELLE's paper was the first to be presented. He skillfully reviewed the work carried out on trypanosomiasis in animals since the 13th ISCTRC meeting held in Lagos in 1971. He reported that new and important data have been obtained particularly in the fields of pathogenics and diagnostics, as well as in the use of trypanocides.

IKEDE made a short, detailed report on pathogenics and trypanosomiasis in animals. Although the disease caused by different types of trypanosomes have certain points in common, the nature of the lesion to the victim varies considerably depending on the trypanosomes.

AMODU and IGE described the stages in the development of anaemia in rabbits experimentally infested with T. brucei and come to the conclusion that anaemia can result from the reaction of self-immunization. MURRAY discussed the changes in the immunization system of animals infected with trypanosomes. The pathology of the disease seems to be characterized by a large variety of immunological abnormalities as well as anaemia and a specific damage to the affected organ.

In a preliminary report, ISOUN and ANDOSA furnished additional data on the pathology of T. vivax and the corresponding difference in the pathology of the disease caused by these germs.

ITAZI and INYARU reported urinary changes in rabbits with chronic T. brucei brucei infection. In the protein content of the urine, they found more globulins than albumin, which suggests that kidney mal-functioning can result in the death of rabbits infected with trypanosomes.

YESOFU exposed pregnant female rats infected with T. congolense and T. gambiense to various stresses. He observed many miscarriages and a low rate of survival among those being nursed.

In rats, not infected but under controlled stress, there were as many miscarriages but the number of new-born that survived until the end of the lactation period was higher.

Recent reports on trypanosomiasis - resistant cattle (see FINELLE) stressed their zootechnical qualities and demonstrate the importance of these species in the development of livestock industry in Glossina - infested regions. Further studies on the mechanics of this tolerance of trypanosomiasis must be carried out. Doctors IGE and AMODU exposed female bovines of the N'Dama species to natural infections of T. VIVAX, T. congolense and T. bucei - bucei as well as to mixed infections. Although all the animals automatically recovered, it was observed that the T. congolense and T. brucei infections had a severe effect on the fertility of the animals.

WILSON, PARIS and DAVIDSON for East Africa and LEEFLANG for West Africa, discussed the important aspects of the problems in the development of ranches in tse-tse infested regions and in the regions not far removed from the first-known infested areas. The existence of trypanosomiasis and the distribution of the various types of trypanosomes in the infestation of livestock are not only directly related to the region of the country and the proximity of tse-tse-infested areas, but also to the effect of the treatment used, to the virulence of the trypanosome and possibly to the development of immunity. Animal trypanosomiasis epizootiology in Ethiopia was discussed by BEKELLE. Nagana is now believed to exist in the fourteen provinces of Ethiopia.

TOURE, BEYDI and SEYE summed up the advantages and disadvantages of the use of the direct method of immunofluorescence in the diagnosis of animal trypanosomiasis. They concluded that in the epizootiological investigations, the test could be used to distinguish between animals which have been in contact with the disease and those which have never been exposed to tsetse flies. However the method must be used in conjunction with other diagnostic methods in identifying these species.

Since 1961 no anti-animal-trypanosomiasis drug has gone beyond the experimental stage. According to Dr. FINELLE, there seems to be a resistance to the drug in diamidines and the isometamidium group.

MWAMBU re-assessed the value of Ethidium in the treatment of infections of livestock by *T. brucei* sub-species and concluded that the use of this product as treatment against *T. brucei* should be limited.

RECOMMENDATION

1. A further research on the basic mechanics related to the pathology of animal trypanosomiasis especially with regard to *T. congolense* and *T. vivax* infections is necessary.
2. In spite of the improvement in the methods of diagnosing trypanosome infections, simple and effective methods of diagnosing the disease on the spot are still needed.
3. The distribution and administration of drugs should be carried out only by qualified persons and this should be the case in every country, so as to reduce the development of resistance to the drugs.
4. Pharmaceutical firms should be encouraged to search for new trypanocides, which are cheap, have long-lasting action and do not produce resistance when employed, simultaneously with those already in use.
5. More detailed research into the mechanics of tolerance to trypanocides needs to be carried out.
6. There is need for data on the cost of anti-trypanosomiasis projects.

PROTOZOOLOGY, IMMUNOLOGY AND BIOCHEMISTRY

Rapporteurs: P.K. Morrey
P. Van Wettere

The first paper by T.T. ISOUN and M. ISOUN dealt with the in vitro cultivation of T. vivax isolated from cattle these writers developed a method for the in vitro cultivation of T. vivax and have obtained the best results by using a 199 medium with a serum supplement. The degree of parasitism of the donating virus strain influences the in vitro multiplication of the parasite.

OTIENO then reported that the age of the tse-tse fly at the time of taking infested food, influenced the survival of T. brucei in the intestine. He concluded that the flies that had been exposed to one or more non-infested sanguine meals, before being fed on infested mice or rabbits, lose their intestinal infection more rapidly than those fed on an infested host within 24 hours of appearance of the infection.

In the following document, TOURE described the biometry, morphology and virulence of T. congolense after 640 applications on mice in 10 years. During the applications there was a prolongation of parasites in the interior of the virus strain. This observation may support the discussion on T. dimorphon, which according to certain researchers may be considered a variation of T. congolense and can be determined, depending on the host, by application. The numerous applications on mice had apparently not changed the power of T. congolense to infect cattle.

In the section on Immunology and Biochemistry of the first document, GRAY observed that among animals infected with different isolates of T. gambiense transmitted by the tse fly, there were many similarities in the development of certain variants of antigens. He also observed that the isolates of this species from different regions of Africa produced many different antigens in common.

In his report, NJOGU spoke on the nature of antigenic components of *T. brucei* and proved that they were found on the surface membrane of these trypanosomes.

AIYEDUN and AMODU described the reactions of intermediate skin cells of rabbits, monkeys and human beings infected with *T. gambiensis*. This reactivity consisted of an Arthus type sensitivity followed by a reaction of the delayed hyper sensitivity type. The nature of this intermediate cell has been demonstrated by the transfer of the sensitive cells of a female rat from an infested to a healthy animal and the reaction of retarded hypersensitivity was histologically characterized by the presence of lymphocytes and macrophages.

AIYEDUN observed in his report that the results indicated that high IgM serum levels are used to diagnose chronic trypanosomiasis if the high IgM levels are adequately controlled in the indigenous population.

RECOMMENDATIONS

The following points were proposed for later research:

1. study of the period of relapse after a NOVIDIUM treatment of *T. vivax* - resistant infections,
2. extension of research on pathogenicity in rodents of *T. vivax* isolated from cattle,
3. use of germs of *T. vivax* inherent in mice (such as those isolated by the Leeftlang team) for research on pathology and sensitivity to drugs,
4. Continuation of *T. vivax* culture experiments which should be tested by infectivity tests in natural hosts,
5. Extension of research to establish the nature of trypanosome antigens and the variation of antigenically different virus strains in the pathogenic trypanosome species.

6. Continuation of research on the method of immunisation against trypanosomiasis particularly in animals. Continuation and expansion of the work of Sadar and his team,
7. Continuation of research on related hypersensitivity reactions in T. gambiense infections and the evaluation of its use as a means of diagnosis,
8. Evaluation of sero-diagnosis tests recently developed for human and animal trypanosomiasis

ENTOMOLOGY

Rapporteurs: V. Itard
U. Abourrahim

Research was undertaken at the I.C.I.P. on salivation of the tse to discover the mechanics of transmission of trypanosomes to the vertebrate host.

These studies that were undertaken with G. morsitans, G. pallidipes and G. austeni which were injected through a membrane of bat's wings, revealed that there was secretion of saliva from the beginning of the injection. The first drop is the thickest and the quantity of saliva secreted is proportional to the size of the species. The average number of saliva drops secreted per minute and the size of these drops are larger in flies that have not been fed for 2 or 3 days than in those that had just eaten. By the fourth day of the fast, the quantity of saliva secreted diminished.

The practical results of these studies indicate that even if an injected fly is unable to feed the first drops of saliva it secretes at the time of the injection, may transmit a high number of trypanosomes.

The glossina species of the palpalis group have six chromosomes divided in three pairs: two pairs of autosomes and one pair of sexual chromosomes. The size and morphology of "X" autosomes and chromosomes are very similar from one species to the other. Only the chromosome which is heterochromatic has certain notable differences according to the species.

In the species of the morsitans group there are two pairs of autosomes and X chromosomes similar to those described in the species of the palpalis group. The heterochromatic Y chromosome differs according to species. Moreover, in all the species of the morsitans group we find a set of small heterochromatic chromosomes, the number of which varies from one species or sub-species to the other. There are also individual variations in the very same species. The presence of these small chromosomes that are totally absent from the palpalis group species may reflect an adaptation to ecological conditions special to the Morsitans group species.

The breeding of G.P. palpalis was undertaken in Kaduna with 3,000 pupa cases collected from the field in January 1972 with the aim of obtaining an autonomous colony of this species, allowing for a surplus of pupa cases or adults that can be used in research work. Flies are bred in temperature - controlled chambers (24° - 24.5°C; 75 - 85% H.R.) and are fed on goat for 15 minutes every day, except Sundays. The twentieth generation was affected 38 months after the breeding began. The daily mortality rate was 1.95% but the highest mortality rates occurred from November to April, during the dry season. This breeding produced approximately 50,000 pupae cases of an average weight of 28.5 mg.

Although in July 1974 the number of females and the production of pupae diminished considerably, the actual state of this breeding is now very satisfactory.

The results obtained emphasize the difficulties met in Africa in the achievement of autonomous rearing of *Glossina*. These difficulties are essentially of a climatic nature although there may well be other factors.

During the dry season in 1972 and 1973 male *G. tachinoids* bred at Maison Alfort, were after radiation, flown over to Chad to be released into the natural environment near N'Djamena.

A study of their behaviour revealed that, after an adaptation period of 48 hours the radiated males spread as fast as the wild males, they satisfied the same ecological needs and had the same food preferences.

After 5 months of experimentation the radiated males which were released in an environment of low density, affected the natural population, since 70% of the wild females caught produced no pupae during the 3 weeks of observation.

A control project involving the release of sterile males, financed by the French government, is being carried out in Bobo-Dioulasso in Upper Volta. The buildings are constructed on land granted to the E.M.V.T. by the Upper Volta authorities. The breeding of *G.P. gambinsis* is undertaken with wild species and pupae from the Maison Alfort breeding. The flies are fed on rabbits.

The aim is to test, from the financial and technical angles, the on-the-spot effectiveness of this method.

The International Centre for Development and Research in Canada, in 1974 organized a scientific group to study the role of entomopathogenic germs, parasites and predators in the campaign against the tse-tse fly. A report was drawn up for the financing organizations, including ICDR in order to obtain funds for research in the biological campaign against the tse-tse fly in order to break the trypanosomiasis transmission cycle

in well-coordinated campaigns which do not pose a threat and to the environment.

The ICRD, with modest financial support, could eventually co-operate in a 3-year research programme with the I.R.C.T.C. in the biological campaign. The broad lines of this co-operation can be as follows:

1. Financing of research in one or more laboratories in Africa on agents that can be used in the biological campaign.
2. Financing of detailed studies on one or more agents, presenting the best possibilities for use. These studies will be undertaken in co-operation with one or more African laboratories and one or more laboratories outside Africa.
3. Recruitment of consultants to review the results of these studies and researches.
4. Training of African students in the practical aspects of the biological campaign and the integrated campaign. Training programmes already exist in the Simon Frazer University in Vancouver, Canada and in the ORSTON in Paris.

RECOMMENDATIONS

The creation in Africa of breeding units to produce large quantities of the principal species of Glossina should be actively encouraged. The surplus from this breeding will thereby allow the intensification of laboratory studies on the physiology and biology of Glossina, genetics and the transmission of trypanosomes.

They would also make available a large number of males that can be used in the genetic campaign. This campaign method serves a definite interest as part of an integrated campaign programme and in certain circumstances, could even be used alone in the eradication of a limited (or well-defined) population of Glossina. In this context it is recommended that the ecological studies be intensified, and particularly

the sampling methods of natural populations, particularly with a view to detecting low density populations. Every effort must be made to intensify research on the possibilities of using predators, parasites, or pathogenic germs in the biological campaign. Contacts should be made with organizations, laboratories or institutions able to provide assistance in this field.

Anti-TSE-TSE-FLY CAMPAIGN

V. SPIELBERGER and B.K. NA'ISA report on tests carried out with Tetracklorvinphos, Bromophos, Dieldrin and Hostaphos in determining whether organophosphates are more effective than chlorinated hydrocarbon and can eventually replace them. These tests were conducted after Riordar (1971) had carried out a laboratory experiment with Bromophos and had concluded that this experiment should be carried further. CHALLIER and LONRAD (1976) also tested four different insecticides in the Sudanese Savannah Zone and concluded that tetrachlorvinphos could also be as effective as Dieldrin. To prove this, Na'Isa and Spielberger carried out field experiments over a three-year period. They compared the duration and toxic effect on tsetse-flies of three different organophosphates and chlorinated hydrocarbon.

The following quantities were used in the spraying operations: 24 percent Tetrachlorvinphos ec at 2.0 kg ai/hectare, Bromophos ec at 2.0 kg ai/hectare and Dieldrin ec 20 percent at 1.5 kg ai/hectare. It was possible to observe the flights before and after the spraying.

Before the spraying with tetrachlorvinphos of a specified area, the *G. palpalis* density was 4/km. Four days after the spraying, this dropped to 1/km but 16 days later the fly population was as dense as before. In the area to be treated with Bromaphos, the *G. palpalis* population was 3/km before spraying. Three weeks later it dropped to 1/km but in the course of the fourth week the population was as dense as before.

All the rivers treated with Dieldrin were free from infection for two months. Hostaphos was also sprayed over a region with *G. palpalis* population of 4/km. In the month following the spraying, the density became 0.18. A month later the density doubled, i.e. 0.3k/km.

The experiments carried out with a solution containing Dieldrin resulted in a total eradication of the insects. Hostaphos gave a better result than Bromphos which in turn was more effective than Tetrachloriviphos.

This experiment has confirmed that Dieldrin is a better insecticide with a longer lasting effect on the field. This has also demonstrated the importance of field tests as opposed to those carried out in laboratories where the flies behave quite differently. It is therefore incumbent upon the countries concerned with the tsetse fly problem to undertake field experiments to discover a more effective organophosphate type of insecticide. Moreover, we can also carry out experiments such as the one described above to enable us discover an insecticide which can weaken the tsetse-fly population and result in a release of sterile male species.

M.T. ABDEL RAZIG, A.I. VAGI, G.A. HASSAN and E. ABDEL RAHMAN indicated in their report that studies were started in 1967 in the Darfur Province and especially near the Wadi Umbelasha district.

The area infested by *G. morsitans* in the North covers latitudes $9^{\circ} 50'$ and $10^{\circ} 13'$ North. The Wadi Umbelasha district, chosen for the studies, extends from Lat. $9.30'$ to $10^{\circ} N$ and Long. 24° to 25° East. Spraying was carried out by aircraft in early 1974. The flies were caught, examined, counted and their ages determined. From the dry and wet blood specimens collected it was possible to determine bovine trypanosomiasis. This experiment revealed that *G. morsitans* was the only species in existence along the Wadi Umbelasha district.

The same experiments revealed that *G. morsitans* were using tree branches and termite hills around trees as their resting places. The *G. morsitans* were observed while they were resting on fallen branches and in the holes formed by external roots, in which they deposit their larvae.

This study revealed the extent of *G. morsitans* infestation in the Northern part of Wadi Umbelasha and the insects resting places. These two findings are essential for an effective tsetse control in any region. Urgent steps have to be taken for a total eradication, as the Wadi Umbelasha region is agricultural.

Further research work should be carried out so as to determine the boundaries of the area infested by *G. morsitans*.

In the early 1950's even though insecticides were commonly used, they were very expensive. Besides, owing to their low degree of effectiveness and to the fact that the forest rangers and protectors of the natural environment were opposed to them, their use was little appreciated. In the latter part of the same years, insecticides were being directly used with or without residual effects. The actual aim of these tsetse-fly control operations was total and permanent eradication of tsetse flies from Northern Nigeria. During the past 18 years the "Tsetse and Trypanosomiasis Division" has disinfected an area of 65,000 square miles or 169,000 km². During the same period, steps had to be taken to remove failures caused by residual infested areas, re-invasion by migrant flies and a concentration of excessively weak insecticides.

These residual infested areas appeared in the Chinade, Koma-dugu, Lower Gongola, Mayo Ine and Vederseran regions. They were detected and eliminated and the area is now free from flies.

However, some areas in the Nutun and Fika regions which at first sight seemed free from flies are in actual fact not. After the spraying operations, a re-infestation by migrant flies re-appeared.

Failure to eradicate the tsetse-flies was partly due to the reduction from 25 to 0.75 percent concentration of the insecticide used. The area was re-sprayed with 2.5 percent concentration and was thus freed from tsetse flies.

The few reverses encountered in the eradication exercise have been overcome: Incomplete spraying of the intended region (a pocket of tse-tse flies was overlooked, i.e. invasion by neighbouring flies, poor preliminary studies, partial eradication, too weak concentration of insecticide, spraying during rainy days).

This document lists the main points that should not be omitted in eradication work. Effective and conscientious supervision is necessary to arouse enthusiasm in young employed who undertake the pre and post spraying exercise as well as the actual spraying under very difficult conditions.

The success of the campaign against sleeping sickness was assumed during the 1956 - 57 crisis when spraying was carried out with 16.2% w/u Dieldrin over T. gambiense and G. Fuscipes infested areas.

This campaign had positive immediate results i.e. reduced persistence of G. Fuscipes and a significant decrease in the new areas affected by sleeping sickness in North and North West Uganda.

A case of Rhodesian sleeping sickness was detected in Busesa in 1971. The epidemic covered an area of 102 km². After studying the case, the anti tsetse campaign units cleared the sites along the paths leading to the watering places of bovines around the wells and bore holes. Spraying was also carried on foot with 3% Dieldrine on tree trunks, bushes and thickets around watering places, wells and reservoirs. A total re-eradication was obtained with 3% Dieldrine. To reduce the reservoirs of trypanosomes all the cattle were inoculated.

In their efforts to fight sleeping sickness, the anti-tsetse campaign units in Uganda succeeded in reducing the concentration of insecticide used from 6.2% in 1957 to 3% in 1971. This is very important if one considers the general outcry over the use of insecticide and its cost. The reduction to a minimum of the concentration of insecticide necessary for total eradication should be one of the main aims of research work.

GENERAL RECOMMENDATIONS

I Vote of Thanks

The Council thanked the President, the Prime Minister, the Government and people of the Republic of Senegal for the warm welcome and generous hospitality extended to the Delegates of the country. It also thanked the government for the excellent facilities placed at the disposal of the Conference.

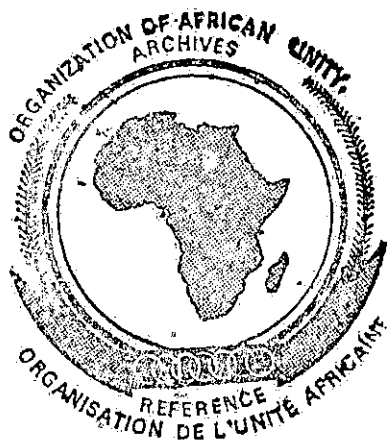
The Council requested the Executive Secretary of the OAU/CSTR to express on their behalf, their gratitude to the President, Prime Minister and the people of the Republic of Senegal.

II Feasibility Study on Trypanosomiasis in Somalia

The Council was very impressed with the progress accomplished in Somalia on the feasibility study with which the CSIRTC was entrusted, and requested the co-operation of the W.H.O. and FAO with OAU/CSTR for the accomplishment of this task.

III FAO and WHO Campaign Anti-Trypanoso Campaigns

Taking note the campaign projects against trypanosomiasis of the FAO and WHO the Council requested their support and expressed the hope that these projects would be undertaken in co-operation with OAU/CSTR.



IV Tsetse Distribution Chart for Africa

The Council congratulated the Executive Secretariat of the OAU/CSTR for having revised the chart of tsetse distribution in Africa which will soon be published. He called on all the agencies concerned to co-operate with all OAU/CSTR to ensure regular up-dating.

V Joint Anti-Trypanosomiasis Action

The Council was impressed by the individual and joint efforts made by the African countries in the tsetse control operations and,

EXHORTS all the African Governments faced with the trypanosomiasis problem:

- a) to increase their allocations for research on trypanosomiasis and tsetse control;
- b) to increase at all levels the staff involved in the fight against human and animal trypanosomiasis and;
- c) to intensify inter-African co-operation in the research and control of this disease through joint projects.

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