I. INTRODUCTION

1. The aim of the Onchocerciasis Control Programme is to control the blackfly vectors of the parasite by spraying insecticide on larval breeding sites, to free populations from the disease, and to enable the land alongside the watercourses to be developed.

2. The participating countries in West Africa are Benin, Ghana, Ivory Coast, Mali, Niger, Togo and Upper Volta. The sponsoring agencies are the Food and Agricultural Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), the World Bank (IBRD), and the World Health Organization (WHO) which is also responsible for the implementation of the Programme. The Programme is financed by contributions from donor countries and international agencies through a special fund administered by the World Bank. Medical research and training activities have so far been financed separately by UNDP. The contribution by participating countries to the cost of the Programme is 1.08%.

3. The Programme was launched in 1974 and operations got under way in stages. By June 1977 the entire area of 700 000 km² was under treatment. The results of the entomological activities are assessed by a medical team, while an economic unit keeps track of the economic activities of the countries.

4. Up to 31 December 1978 the activities of the Programme during the first five years had cost US$ 39 799 022. The breakdown of expenditure by category was as follows: vector control 57.25%, epidemiological evaluation 4.79%, economic development 0.53%, applied research, environmental surveillance and training 4.94%, Programme headquarters and administrative support at Ouagadougou 13.26%, meetings 1.10%, administrative and technical support from WHO and FAO headquarters and from the Liaison Office at the Regional Office in Brazzaville 6.57%, Joint Coordinating Committee 0.77%, capital expenditure 10.79%.

5. In carrying out the aerial operations over about 14 000 km of rivers, 17 902.8 helicopter hours and 3 466.7 fixed-wing aircraft hours were used and some 580 743.6 litres of insecticide were applied.
6. The basic epidemiological evaluation carried out by the Programme covered 329 villages, and 85,315 individuals were examined. 32 research contracts on vector ecology, vector control and the epidemiological, clinical, parasitological and chemotherapeutic aspects of the disease, and 6 contracts for the aquatic monitoring, totalling US$ 1,964,804, were signed or renewed with institutions and laboratories in the Programme area and abroad.

January - March 1979

7. The vector control operations were characterized during the quarter by a particularly satisfactory entomological situation throughout almost the entire Programme area and by the extension of treatments in Ivory Coast to the south of the initial limit of the Programme area. This made it necessary for the first time since the start of the Programme, to use a seventh helicopter in the dry season. Epidemiological evaluation continued in the extension zone in Ivory Coast and in the study area in Benin. Chemotherapeutic and research trials were carried out in the field. The work of the Economic Development Unit concentrated on data collection for updating the report on the socio-economic development of the countries; the training of 14 trainees begun in 1978 continued, and further trainees were accepted. The administrative services continued to support the technical units, while taking the necessary measures to ensure the smooth running of activities in 1979.

8. The Programme paid attention to the preparation of the Second Phase, 1980-1985, its financing, the drafting of a new memorandum of understanding, the preparation of the third contract for aerial operations from 1980-1982, and the setting-up of the Commission to study the long-term prospects of the Programme announced in Lomé in December 1978 by the Director-General of WHO.

II. CURRENT ACTIVITIES

A. VECTOR CONTROL

Spraying

9. From the second week of the year onward, two helicopters were found sufficient to carry out all the treatment circuits in the western zone from the base at Bobo-Dioulasso, and from the fifth week onward two helicopters were also sufficient to treat the eastern zone from the Tama base, but the extension of treatments in March in the southern part of the Programme area in Ivory Coast made it necessary to bring a third treatment helicopter into service in the western zone from the tenth week onward (tenth cycle). From this time onward treatments were undertaken on the stretch of the Marahoué between its confluences with the Béré and Bandama, on the Sassandra between Guessabo and its confluence with the Nzo, on the section of the Nzo between its confluences with the Gbe and the Sassandra, and finally on the section of the Bandama between the Kossou dam and Tiassalé.
10. On the other hand, the discontinuation of treatment since December 1978 was still maintained at the end of March on the Dienko, Tiao, eastern Lérah and Farako in the Phase I area. Many watercourses are still dry, and although some rain was recorded throughout the Programme area, in the second half of March this has not made any change in the flow of the watercourses. By 12 March the Intertropical Convergence Zone had moved up to 12° north, placing the whole reinvasion area south of the ITCZ.

11. Generally speaking the treatments gave satisfactory results, but in a certain number of active sites, especially in the eastern zone, the spraying techniques had to be modified in order to neutralize the sites. These sites do not require a large amount of insecticide, but a certain minimum amount of liquid is needed to achieve appropriate dispersal of the product. The proportions of the water/Abate mixture have gradually changed from 1/1 to 5/3.

12. The amounts of insecticide used have fallen considerably, from 11 451.7 litres in January to 5 995.4 litres in March. Only 55 litres of insecticide were used in March in the whole of the Phase II zone. However, this was partially due to force majeure.

13. Following the closure of Ghana's borders on 10 March, the Ghanaian authorities decided without advance warning to ground all the aircraft at the Tamale air operations base which carry out aerial operations throughout the eastern half of the Programme area, i.e. in Ghana, Togo, Benin, Niger and the eastern part of Upper Volta.

14. As soon as this decision was known on 12 March the Programme took the necessary measures to ensure that regular treatments would continue as far as possible in the countries of the eastern zone affected by the decision. A temporary base was quickly set up at Lama-Kara, and from 15 March onwards it served as operational base for one of the aircraft from the Bobo-Dioulasso base, which was recalled from its treatment circuit in the western zone to carry out the work normally performed from the Tamale base.

15. This emergency reorganisation called for changes in the treatment circuits in both the western and eastern zones and for supplementary flying time for pilots and aircraft. In this way it was possible to carry out the treatments in time on all rivers requiring treatment throughout the Programme area, with exception of the Black Volta and Oti, rivers that form the Ghanaian frontiers with Ivory Coast and Togo respectively. These watercourses were purposely omitted from the treatment circuits so as to avoid any incidents. In Ghana itself the most vulnerable sites were fortunately accessible by road at this point in the dry season and were treated by hand by teams from the Tamale sector.

16. The decision by the Ghanaian authorities applied to the whole country and was not particularly directed at the Programme's aircraft. The situation continued for two weeks, and it was only because it happened in the dry season that it was possible to deal with it. The emergency measures undertaken would have been completely inadequate in the rainy season.
17. The flying hours used during the first quarter of 1979 are broken down as follows:

<table>
<thead>
<tr>
<th></th>
<th>Spraying</th>
<th>Prospection</th>
<th>Administration</th>
<th>Total</th>
<th>Guaranteed hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Helicopters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>404.1</td>
<td>24.0</td>
<td>-</td>
<td>428.1</td>
<td>360</td>
</tr>
<tr>
<td>February</td>
<td>284.9</td>
<td>30.5</td>
<td>2.3</td>
<td>317.7</td>
<td>360</td>
</tr>
<tr>
<td>March</td>
<td>266.8</td>
<td>14.3</td>
<td>4.9</td>
<td>286.0</td>
<td>360</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>955.8</td>
<td>68.8</td>
<td>7.2</td>
<td>1 031.8</td>
<td>1 080</td>
</tr>
<tr>
<td><strong>Fixed-wing aircraft</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>67.5</td>
<td>-</td>
<td>12.7</td>
<td>80.2</td>
<td>100</td>
</tr>
<tr>
<td>February</td>
<td>40.3</td>
<td>-</td>
<td>27.5</td>
<td>67.8</td>
<td>100</td>
</tr>
<tr>
<td>March</td>
<td>39.7</td>
<td>-</td>
<td>12.7</td>
<td>52.4</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>147.5</td>
<td>-</td>
<td>52.9</td>
<td>200.4</td>
<td>300</td>
</tr>
</tbody>
</table>

18. The breakdown of the 23 236.6 litres of insecticide applied during the first quarter of 1979 is as follows:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Phase</th>
<th>Phase</th>
<th>Phase</th>
<th>Phase</th>
<th>Phase</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>II</td>
<td>III-0</td>
<td>III-E</td>
<td>IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>2 532.1</td>
<td>236.1</td>
<td>2 045.3</td>
<td>1 674.7</td>
<td>4 963.5</td>
<td>11 451.7</td>
</tr>
<tr>
<td>February</td>
<td>1 531.7</td>
<td>131.7</td>
<td>912.0</td>
<td>555.8</td>
<td>2 658.3</td>
<td>5 789.5</td>
</tr>
<tr>
<td>March</td>
<td>946.3</td>
<td>55.0</td>
<td>562.9</td>
<td>306.4</td>
<td>4 124.8</td>
<td>5 995.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5 010.1</td>
<td>422.8</td>
<td>3 520.2</td>
<td>2 536.9</td>
<td>11 746.6</td>
<td>23 236.6</td>
</tr>
</tbody>
</table>

Other aerial operations

19. Prospection flights were carried out on the Nzo, Ko, Sassandra and some other rivers in the extension zone in Ivory Coast, prior to the treatment of these rivers which was scheduled to begin in March, and on the Kulda, a tributary of the White Volta in Ghana. One of the epidemiological evaluation teams also made a prospection flight in the Loumana district in the Phase I area to assess the proximity of the breeding places to certain villages highly affected by onchocerciasis. The aircraft based at Tamale was used for administrative flights.
Aerial contract

20. In accordance with the contract the company fleet at the Programme's disposal during the quarter consisted of six helicopters and two fixed-wing aircraft in January and February and seven helicopters and two fixed-wing aircraft in March.

21. The staff on assignment from the air company at the end of the quarter consisted of 10 helicopter pilots, 2 fixed-wing aircraft pilots, 2 chief mechanics, 6 mechanics and a field project administrator.

22. The next discussions, which from now on will cover routine matters, between the representatives of CCC, Viking and the Programme will take place in Ouagadougou from 8 to 13 May.

Entomology

23. This quarter has perhaps shown the most spectacular results of our activities since the Programme began. Blackfly density fell virtually to zero in all the regions treated, despite the deliberate interruptions of insecticide applications in the Comoé and Black Volta basins throughout the months of December 1978 and January 1979.

24. These results tend to accentuate the importance of the difficulties at the four sites where blackfly populations continue to survive despite the repeated efforts to eliminate them. The sites concerned are those at Gbasse on the Sota, Tityra on the Keran, at Sugu and Wawa on the White Volta, and a site above Sansane Mango on the Oti. The last three sites were finally brought under control by diluting the insecticide so as to give better coverage of the treatment points.

25. During the first week of March, in anticipation of an increase in the number of breeding places, treatments were started further south on the Sassandra and Bandama in the extension zone in Ivory Coast, with the aim of eliminating as many reinvasion sources as possible. This means that all the watercourses in the Sassandra, Bandama and N'Zi basins where the savanna form of S. demmoum breeds are now being treated. The blackfly density in the south-western districts which have hitherto been invaded every year will be monitored for the next six months.

26. Meetings have been held between sector and subsector chiefs at Lama-Kara, Bobo-Dioulasso and Bouaké in order to ensure that a sufficient number of catches are made every month so that the annual biting rates (ABR) and annual transmission potentials (ATP) can be calculated in accordance with the definitions laid down by the SAP Working Group on 6-8 June 1977. Of the 639 catching points set up since the studies began, 258 have been selected for monitoring at least twice monthly, and 83 of these points will be monitored at least four times a month throughout the year.

27. Mr Gaston Zerbo, entomologist, attended the Third Congress on Vector Control in Tropical Areas organised by the Marseille Chamber of Commerce and Industry from 13 to 16 March. He read a paper on the strategy and results of onchocerciasis vector control in the Volta Basin area. The Congress was attended by some 200 medical, veterinary and agricultural entomologists.

29. The following articles were published in Tropenmedizin und Parasitologie in December 1978:

- Omar, M.S., Histochemical enzyme-staining patterns of Onchocerca volvulus microfilariae and their occurrence in different onchocerciasis areas;
- Vajime, C., Quillevéré, D., Distribution of the Simulium damnosum complex in West Africa with particular reference to the Onchocerciasis Control Programme area;
- Garma, R., Use of morphological characters in the study of Simulium damnosum s.l. populations in West Africa;
- Walsh, J.F., Light trap studies on Simulium damnosum s.l. in Northern Ghana.

Jet Al aviation fuel

30. The quantities of Jet Al aviation fuel we shall need in 1979 for the air operations are estimated at 835 000 litres, an amount for which exemption from duty and tax has been requested.

31. Mobil-Abidjan is to supply the aviation fuel for the entire western area, i.e. Upper Volta, Mali and Ivory Coast, and its representative has agreed with the Programme on procedures for delivery to the three main distribution points in this area. The Ivory Coast has been notified of the location of the various storage points in its extension area, and the collaboration of the local authorities has been requested to ensure the safety of the fuel and insecticide stored at these points.

32. In the eastern zone, i.e. Togo, Benin, Ghana and Niger, different arrangements have been made with the suppliers for the supply of fuel, and 800 new drums have been ordered from England for delivery to Lomé for use in this zone on a trial basis. Shell-Ghana will supply 100 000 litres of fuel in 275 new drums, which will be filled at the pumps at Tamale airport, while Shell-Togo will supply 150 000 litres in 275 new drums which will be filled from a tank at Lomé-Kara. We have requested Benin for permission to import 250 drums for filling at the SONACOP depot in Parakou.

Insecticide

33. Our 1979 needs for Abate, estimated last September at 180 000 litres, have been re-estimated in the light of the amounts used in the last quarter of 1978. The 1979 order has been increased to 230 000 litres.

34. In March, samples of lot 342 received in 1976 and of lot 499 received in 1978 were sent to the Onchocerciasis Research Institute in Bouaké for efficacy tests.
35. In January the Programme received a visit from Mr André Boidin, managing director of Cyanamid-France, accompanied by several colleagues from Roussel-UniClaf, Paris, from Procida-Sofaco, Abidjan, from Procida, Marseille, and from Sofaco-Procida, Dakar. They had talks with officials of the Vector Control Unit about insecticide utilization. Special emphasis was placed on the difficulties encountered in developing new formulations corresponding to our requirements, on the importance we attach to the protection of the environment, and on our constant concern to be able to deal with any resistance to the insecticide currently used.

36. The Programme also received a visit from Mr Cuended and Mr Bizalion of UNIDO in Vienna. As there is a project to set up an insecticide manufacturing plant in Bobo-Dioulasso, UNIDO is studying the market in Upper Volta and neighbouring countries. Mr Bizalion indicated that, according to the survey conducted so far, the setting-up of a manufacturing plant would prove profitable through the utilization of insecticide for cotton crops alone.

37. The Programme Director made reference to the meeting on insecticide held in Geneva last July, to the need to find a replacement insecticide, and to manufacturers' efforts in this direction. Moreover, the insecticide formulation we use is particularly complex. In conclusion, the Director indicated that for the immediate future the local manufacture of an insecticide was of no direct interest for the Programme, and that in any market calculation for a factory in the Programme area consumption by the Programme should be estimated as minimal.

Hydrobiology

38. Contacts were made with officials responsible for hydrobiology in the institutes, universities and national services in Dakar, Abidjan, Lomé and Cotonou to discuss cooperation with these establishments in monitoring the rivers treated with insecticide. All the officials met displayed keen interest in the subject. Nevertheless, in these countries there are at present no hydrobiological units dealing with this problem. The establishments for higher and technical education in each of the capitals visited, however, have hydrobiology research units and would be prepared to supply candidates for specialized training.

39. In preparation for the large-scale trials to be conducted in the rainy season to compare the Abate formulation manufactured by American Cyanamid with the formulation manufactured by Procida, and to evaluate the impact of the former formulation on non-target fauna, the Programme is seeking a qualified hydrobiologist. His task would be to monitor the rivers treated with the American Cyanamid formulation for six months starting in May, just as the rivers treated with the Procida formulation are monitored elsewhere.
Hydrometry

40. The Programme received a visit from Dr G. Kenitz, Director of the UNDP project in the Niger River basin, who was making a study on the hydrometry of all the rivers in the Niger basin. Dr Kenitz is interested in all data we can provide on the River Niger itself and all its tributaries, because the project provides for the installation of automatic telemetric equipment which would transmit daily measurements of river flow to the Niamey Centre by radio and possibly by satellite. Eventually it is also hoped to make forecasts of the flow of certain rivers on the basis of the flow of their tributaries and the rainfall levels recorded some days earlier. Dr Kenitz and officials of the Vector Control Unit discussed the processing of the data, because any system that would reduce the present time-lag of 1-4 days between the reading of the flow gauges and the treatment of the rivers would enable us to increase the accuracy and efficacy of our activities.

Aquatic monitoring

41. A rider to the contractual services agreement signed with ORSTOM on 1 March 1978 was signed at the end of March this year. It concerns the monitoring of the rivers treated with insecticide. This rider covers the work from 1 January to 30 June 1979 for an amount of $ 43 500.

42. To meet the wish expressed by the Programme that the ORSTOM Hydrobiology Section in Bouaké will continue its surveillance programme until the end of 1979, which would give time to set up structure to take over, ORSTOM has stated its willingness to maintain a team in Bouaké consisting of a hydrobiologist, a technician and a medical entomologist.

43. A contractual agreement of an amount of $ 13 000 was signed with Salford University in the United Kingdom for the analysis in 1979 of the aquatic monitoring data in the Programme area.

44. Dr Colin P. Fairhurst of Salford University spent one week as a consultant in Geneva, working on aquatic monitoring data collected in the Programme area.

B. EPIDEMIOLOGY

Second round evaluation

45. The second round evaluation in Northern Ghana was completed with the simple evaluation of five villages situated on the Kulda, the Kulpawn, the Daka and the Kole: Goreba-Somun, Yagaba, Kulun, Yapala and Marugu. Altogether 1234 people were examined there. In these villages in general level of onchocerciasis has not varied significantly since the first visit. On the other hand, no new onchocerciasis cases have been detected in children under five.
Basic evaluation

46. The basic evaluation in the extension zone in the Ivory Coast covered 18 villages this quarter. In six of these villages detailed evaluations including ophthalmological examinations were carried out, while the simple evaluations were limited to parasitological examinations and tests of visual acuity. Four villages in the Cavally basin were visited: Gbantouleu, Sioba, Oué and Nimpou. Three villages in the Sassandra basin were visited: Midrou, Tien Oula and Bagro in the Guessabo region. Nine villages in the Marahoué basin were visited: Paradouou, Sadounou, Bereman, Souroumana, Kouroukoro, Barmkoro, Tofesso, Kavako and Bagouzra. Finally, Békourou and Assoumanou on the Comoé were also visited.

47. In the Cavally basin, where the entomologists record a high level of transmission, a detailed evaluation was carried out in the four villages visited. The prevalence there is very high even among young people. The parasite counts are high, but there are no severe eye lesions or skin lesions. There is virtually no onchocercal blindness. The disease has a "forest" appearance. Although onchocerciasis is an inconvenience to individuals in these areas, it is not a major public health problem. The same observations were made in the Sassandra basin, where the village of Bagro was subjected to detailed evaluation. Onchocerciasis is not involved in any of the cases of blindness and pre-blindness recorded there. In the Marahoué basin, apart from Tofesso on the Béré, the situation in the eight other villages is hyperendemic. Seven of them show a prevalence rate above 70%. Mean microfilariae density is above 10 everywhere, except at Tofesso where it is 8.9. The blindness rates vary between 2% and 6%. The two villages visited along the Comoé, in Abengourou department, which were subjected to detailed evaluation, display a distinctive epidemiological pattern. The prevalence of the disease and the parasite counts are high, and many skin lesions are found, particularly depigmentations. Ocular parasite levels are moderate, and practically no severe and irreversible eye lesions are found. On the other hand, cataract appears to be an important cause of blindness. Here again the disease displays a forest appearance.

48. The evaluations in the extension zone in Ivory Coast will continue in April in six villages on the N'zi and the Kan in the departments of Dimbokro and Yamoussoukro.

49. Basic evaluations have started in the study zone in Benin. Eight villages were visited in March: Idadjio, Abagoulé, Djagbalo, Gori and Assio in the Ouémé basin, Moka in the Okpara basin, Koukoudji in the Zou basin, and Fonkodji in the Kouffo basin. Of the 2,069 people listed, 1,902 were examined. Six of these eight villages are in a hyperendemic situation and the parasite counts are high. On the other hand, very few blind people were found. The blindness rates are everywhere below 2%, except at Koukoudji on the Zou (2.9%).

50. The evaluations in the study zone in Benin will continue in April.

Chemotherapeutic trials

51. Ophthalmological examinations were carried out in January on some 400 inhabitants of the hyperendemic village of Bonga, Tiédélé subprefecture, on the Red Volta in Upper-Volta, to supplement the detailed evaluations carried out in the same village last July. It was here that the chemotherapeutic trials on suramin were to be conducted in March.
52. Eighty patients there were selected for treatment. The selection was made from people with high microfilariae counts and cases at ocular risk with incipient irreversible lesions. The selection excluded subjects who were too young or too old, blind people, subjects with a disease other than onchocerciasis or in a condition of general weakness, and pregnant women. As this is an area where transmission has been interrupted, subjects at no visible ocular risk were also excluded.

53. The objective is not to effect a radical cure of the treated patients but to reduce the parasite count sufficiently to limit and if possible eliminate ocular risk.

54. The therapeutic protocol selected is derived from a schedule already used in Sudan (Health Services) and Mali (Dr A. Rougemont). The customary dosage of 5.2 g in six injections, given at a rate of one injection of 0.2 g in the first week and 1 g per week for the next five weeks, was changed. The subjects treated in Bonga should receive a total dose of 4.0 g administered in progressive weekly doses of 0.2 g, 0.4 g, 0.6 g, 0.8 g and twice 1 g for patients weighing 50 kg and over, the dosage being proportionately lower for subjects of lower weight.

55. Treatment began on 7 March and was planned to end on 12 April. It was administered by the Mobile Ophthalmology Team of the Upper Volta Health Ministry under the authority of the Chief Medical Officer of the Ouagadougou Sector and under the scientific and technical supervision of the Programme, which made weekly checks on proteinuria and cylindruria.

56. Ophthalmological check-ups were scheduled three weeks, six weeks, 10 weeks, three months and one year after the start of treatment. Parasitological and clinical check-ups are also planned at the same intervals.

57. The first ophthalmological check-up took place on 28 March. It revealed no marked changes either in the lesions or in the ocular parasite count.

Field research

58. The opportunity of the epidemiological evaluation in Ivory Coast was seized to study the intradermal reaction to tuberculin in some 400 inhabitants of three villages in the Cavally basin, in the forest zone. The purpose of this study was to test the immune response of the subjects in relation to the onchocerciasis endemicity level, geographical characteristics, and the clinical and ocular manifestations of the disease. The study shows that the considerable excess of negative reactions noted earlier in a hyperendemic savanna region (Mali) is not repeated in a hyperendemic forest region. An identical study is to be carried out in April in the village of Bonga in a savanna zone and subsequently in other villages both in the savanna and in the forest, to confirm the results obtained so far. During the months to come particular attention will be paid to the correlation between the eye lesions and the forms of reaction to tuberculin.

59. Also in the Cavally basin, samples were taken for examination for T. streptocerca. They all proved negative.
60. A study of the adult parasite was carried out on nodule samples taken during chemotherapeutic trials at Bonga. The samples were taken from 17 patients before the start of treatment. In one of the patients a single thoracic cyst weighing 16.3 g could not be digested and has been eliminated from the results given below:

Number of patients: 16  
Number of sites: 17  
Total cysts treated: 72  
Number of cysts per site: 1 to 10 (average 4.2)  
Weight of cysts: 0.08 to 21.16 g (average 2.2 g)  
Number of adult worms extracted: 340 (average per cyst 4.7)  
Female/male ratio: 1.64

Functional status of live females:
- with intrauterine mf or embryonated eggs in the final stage 129
- with eggs only and no visible embryo 38
- non-pregnant females, uterus filiform and often dark 28

<table>
<thead>
<tr>
<th>Weight (in g)</th>
<th>With live worms</th>
<th>With degenerated worms only</th>
<th>Live</th>
<th>Average per cyst</th>
<th>Degenerated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M  F</td>
<td>M  F</td>
<td>M</td>
<td>F</td>
<td>M  F</td>
</tr>
<tr>
<td>0.5</td>
<td>24 3</td>
<td>12 24</td>
<td>0.5</td>
<td>1</td>
<td>- 10</td>
</tr>
<tr>
<td>0.5-1</td>
<td>8 3</td>
<td>12 16</td>
<td>1.5</td>
<td>2</td>
<td>1 4</td>
</tr>
<tr>
<td>1-2</td>
<td>16 -</td>
<td>33 43</td>
<td>2.1</td>
<td>2.7</td>
<td>1 5</td>
</tr>
<tr>
<td>2-5</td>
<td>10 -</td>
<td>26 44</td>
<td>2.6</td>
<td>4.4</td>
<td>- 3</td>
</tr>
<tr>
<td>5-10</td>
<td>4 -</td>
<td>9 27</td>
<td>2.3</td>
<td>6.8</td>
<td>- 1</td>
</tr>
<tr>
<td>10</td>
<td>4 -</td>
<td>27 41</td>
<td>6.8</td>
<td>10.3</td>
<td>- 1</td>
</tr>
<tr>
<td></td>
<td>66 6</td>
<td>119 195</td>
<td>1.8</td>
<td>3.0</td>
<td>2 24</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>340</td>
<td></td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>
The majority of the cysts weigh less than 1 g. The only totally inactive nodules (6) are found among these small cysts. Most contain a single female, often not fertilised (non-embryonated eggs) or a pair of parasites; in the latter case the female is very active genitally. The small cysts may therefore be said to contain either young worms, in which case they are particularly dangerous to the patient, or old worms in the process of degeneration.

92% of the isolated worms are whole, non-fragmented and presumed to be alive. 85% of the females are in a period of genital activity. In 34 females (17%) the epidermis is entirely or partly brown in colour, which is supposed to be a sign of advanced physiological age and a prelude to degeneration. It has been observed, however, that although females with an empty uterus are often brown, many females of this colour are still very active (intrauterine microfilariae and embryonated eggs).

Other activities

61. During the quarter the Unit benefited from the services of Dr A. Rolland, ophthalmologist, in the Programme area for a three-month consultantship; in addition, Dr B. Jean of the Rodenwaldt Institute in Lomé and Dr K. Dadzie of Tamale Hospital took part in the ophthalmological evaluation of Bonga. The Unit also welcomed Dr S.M. Omar of the Bernard-Nocht Institute in Hamburg and assisted him in his research. Dr Bruce Green and Dr Hugh Taylor of the Wilmer Institute of the Johns Hopkins Hospital in Baltimore, who are working on onchocerciasis in Liberia, had talks with their colleagues from the Unit in March, specifically to discuss chemotherapy problems.

C. ECONOMIC DEVELOPMENT AND PUBLIC HEALTH

62. Besides listing, analysing and classifying the available documents, the Unit continued to compile an inventory of socio-economic development projects, to classify the statistical data, and to keep up to date the card index of projects in each country.

63. A socio-economic survey will seek economic, demographic, health and sociological indicators and will result in the preparation of a statistical mini-yearbook with a cartographic approach.

64. The study of the role of women in development will be resumed; it is intended to institute studies on young people in rural areas, their problems and future prospects, on the development of crafts, and on migration policies in the light of the settlement experiments now in progress.

65. In the public health field, the support for national services in training the necessary staff for the development of primary health care and in the integration of health and social components in the development zones will be continued.

66. Visits were made to all the countries participating in the Programme to collect the information needed for updating the annual report on socio-economic development in the Programme area. A first draft of this report was to be submitted to the countries at the third meeting of National Committees in Bamako.
67. A visit was made to the area covered by the Volta Valleys Development Authority (AVV): the Wayen forest district, the Mogoedo experimental unit, the site of the Bagré dam, and villages 1 and 3 on the outskirts of Bané.

68. The public health adviser took part in a mission to evaluate the development of primary health care in the Kaya and Kongoussi regions, Kaya prefecture, in Upper Volta. In the Kaya region 12 village maternity centres have been set up; in the Kongoussi region 31 primary health workers and 16 village birth attendants have been trained for work in 29 villages. Similar visits are planned to all the health prefectures in the country. In March the mission was scheduled to visit the Tenkodogo region.

69. The Programme attended the national seminar organized to study the results of the survey on migration movements in Upper Volta in 1974 and 1975. The seminar called for the preparation of further documentation and paved the way for setting up a national data bank on migration.

70. Miss Yameogo, who is in charge of the AVV social services, visited the Programme for talks about the organization of health services within the area covered by the AVV. Field visits will be made with the public health adviser.

71. Mr Bernard Peraud of the Permanent Secretariat of NGOs in Upper Volta, a hydraulic engineer and coordinator of dam construction work in the Koudougou region, visited the Programme to learn about health and ecological problems connected with the building of dams and water pipelines.

72. At the suggestion of the Regional Office, contacts were established with Mr Ismailla Diop of the Multinational Programming and Operational Centre (MULPOC) based in Togo, who deals with rural projects financed by UNDP. The discussions dealt mainly with primary health care and the integration of the health component into rural development projects.

73. The Ministry of Public Works of Upper Volta asked the Programme's views on the implications for the Programme of the dam construction project at Pama: the construction of this dam would destroy a large number of larval sites and would consequently substantially reduce the current breeding rate.

74. Two Progrès volunteers, Mr Philippe Bataille and Mr Christian Noël, responsible for the construction of small dams in the Centre-West ORD, came to ask the entomologists and the public health adviser about the repercussions of their work in the ecological and health fields.

75. The Programme took part in the Seminar on Migration in West Africa organized by the Upper Volta Ministry of Planning and Cooperation, the World Bank and OECD from 16 to 19 January, and in the Symposium on Demography organized in Abidjan by IPORD (Demographic Research and Training Institute) and CIRES (Ivory Coast Centre for Economic and Social Research) from 22 to 26 January. It also took part in the work of the Commission on Maternal and Child Health of the Upper Volta Ministry of Public Health.
76. The Programme was invited by the Director-General of the Sahel Institute of the Inter-State Committee on Drought Control in the Sahel to attend a meeting of the Institute's research workers and technicians, to be held in Bamako on 19 and 20 April following the establishment within that Institute of a socio-economic unit which is undertaking a research and training programme on health, nutrition and water. Dr Djoibili Koné, the Institute's adviser on health and nutrition, has had talks with the Programme's public health adviser on the preparations for the meeting.

77. A mission from the European Development Fund, consisting of Mr Sverard, Mr Gilard and Mr Heughean, visited Nadina-Diassa in the Bougouni subsector of the Programme in Mali, accompanied by a number of national officials. The Bamako sector chief, who accompanied the mission, gave an account of the work of the Programme in general and in that region in particular.

78. The Programme was invited to take part, from 23 April to 5 May, in the session on methods of action for integrated regional development being organized by the Directorate for Continuous Training of the Ministry of Higher Education in Senegal and by the UNESCO Division of Human Settlements and Socio-cultural Environment.

79. Following the receipt of the documents for the second MULPOC conference of experts and ministers in West Africa based at Hiamey, the Programme expressed its gratitude to the Director of MULPOC and asked to be sent the "MULPOC liaison bulletin on intergovernmental organizations in West Africa" and to be kept informed of progress in the project entitled "Integration of women in economic development in Africa".

80. The Programme is studying the arrangements for a mission to Programme Headquarters by an official of the TDR working group responsible for the socio-economic aspects of tropical diseases.

81. On 8 March 1979 Mr Arébéné Song-Naba Kiswinsida, a fourth-year student of economic sciences at Benin University, called to request documentation and information on the economic development projects. Mr Song-Naba is preparing a dissertation on: "The development of the Volta valleys: its social and economic implications for Upper Volta".

82. Miss Nebout of Ouagadougou University (Faculty of Letters and Human Sciences) called to discuss the choice of a study topic connected with the development of rice-growing in the Kou valley of Upper Volta.

83. At the end of March the Programme was visited by Dr P. Grant of the Regional Office in Brazzaville. One aspect of Dr Grant's mission concerned the setting-up of primary health care in Yakala canton. He took the opportunity to meet the Minister of Health of Upper Volta and the responsible national officials at the Ministry of Health. Accompanied by the Programme's public health adviser, Dr Grant made a field visit during which he had talks with the Subprefect of Zabré and visited the canton of Yakala. He also spoke to the Tenkodogo medical officer and the Head of the Bombousougouou Health Centre. Following his field visit and the various discussions with the health authorities, Dr Grant drew up a plan of action which will be submitted to the national authorities.
D. RESEARCH AND TRAINING

Research

84. The Programme has drawn up its comments on the justification and financing of five research proposals submitted by the Onchocerciasis Research Institute (IRO) in Bouaké:

- Studies on the development of animal-infesting Onchocerca species in S. damnosum s.s. and S. sirbanum;
- Influence of human and vector migration on Programme strategy;
- Study of the resting places of S. damnosum s.s.;
- Research on new larvicides;
- Research on imagocides.

These proposals have been reformulated and were being studies at the end of the quarter.

85. A research contract for a sum of $2 000 was concluded with the Department of Animal Biology at the Faculty of Sciences in Dakar. In relation with the previous studies concerning the effects of DEC, the purpose of the contract is to examine the ultrastructural aspects of the degeneration of dermal O. volvulus microfilariae under the effect of suramin, in order to detect any difference in mode of action between suramin and DEC.

86. A research contract for an amount of $20 000 was signed on 12 March with the Biosystematics Research Institute, Ottawa, Canada, which had already compiled a key for identifying the major species of the S. damnosum complex in the Programme area. The contract covers the continuation of this work in order to determine other morphological characteristics in addition to those used for compiling the key, particularly in order to differentiate S. damnosum, S. sirbanum and S. squamosum females.

87. Dr S.M. Omar, who in 1978 made a study of the parasite in the vector together with Programme entomologists, undertook a further consultanship of two-and-one-half months to continue this study, this time together with Programme parasitologists. The aim is to investigate whether the distribution of the five different types of microfilariae identified so far by histochemical staining is a matter of chance in adults, or whether each type is associated with one or more vectors of the S. damnosum complex and possibly with one or more different epidemiological patterns of the disease. This study was undertaken in the Danané region on the Cavally in Ivory Coast and continued in the Tiélé region in Upper Volta. The initial results reveal very substantial differences between the microfilariae collected in the forest zone and those collected in the savanna zone.
88. Professor R.H. Kips, a Belgian scientist, visited WHO headquarters to learn about the use of insecticides in the Programme area and the long-term prospects. He was particularly interested in the simplification of methods for field application. Professor Kips is to visit the Programme area during the first fortnight in October in order to determine to what extent the chemistry laboratory of which he is in charge could make a technical contribution to the analysis of insecticides used in the control of the onchocerciasis vector.

89. Dr Schulze-Key, of the National Hygiene Institute of Togo, in Lomé, paid a visit to the Programme in order to establish cooperation with the Epidemiological Evaluation Unit, so that the Institute can continue its work on isolating adult filariae by enzymatic digestion in collagenase.

90. Dr B. Copeman, a veterinary parasitologist from James Cook University, Townsville, Australia, who is at present studying the possibility of using cattle in the selection of new drugs, came to obtain first-hand information that might contribute to his research.

91. In pursuance of suggestions made at the fifth session of the JCC in Lomé, and following discussions between the Programme and the Special Programme for Research and Training in Tropical Diseases (TDR), it was decided that:

- the reports on research on new drugs prepared by the TDR Scientific Working Group on Filariasis would be submitted to the Programme's Scientific and Technical Advisory Committee for information;
- there should be joint participation by the Programme and TDR in meetings of the Programme's Joint Coordinating Committee and TDR's Joint Coordinating Board;
- the two Programmes should agree on the use of funds if additional funds should become necessary for any aspect of research on new drugs.

Training

Study fellowships

92. The application by Dr I.N. Nartey of Tamale Hospital in Ghana for a fellowship in ophthalmology at the Royal College of Surgeons in Ophthalmology in London was accepted by the Programme. The administrative formalities are currently being dealt with.

Practical training fellowships

93. Nine Guinean fellows continued the training courses begun at the end of last year. They are:

- Mr Mamadou Balde, entomologist, National Prevention Service, malaria project, Conakry, for two weeks' training in entomology at the IRO in Bouaké, in continuation of the four months' practical training he received there in 1978;
- Dr Sekou Camara, medical officer, School Medical Inspectorate, Conakry, for one month's training in parasitology with the Programme's Epidemiological Evaluation Unit, continuing the two months' practical training he received there in 1978, followed by two weeks with the African Institute of Tropical Ophthalmology (IOTA) in Bamako, and one month at the Bamako School of Medicine;

- Mr Amadou Diallo, Chief, Parasitology Section, National Prevention Service Laboratory, Conakry, for two weeks' training in parasitology with the Programme's Epidemiological Evaluation Unit, continuing the two months' practical training he received there in 1978;

- Mr Lah Dore, Team Leader, onchocerciasis control project, Conakry, continuing the 12 months' training in ophthalmology begun in September 1978 with IOTA in Bamako;

- Mr Ciba Gbamou, parasitologist, onchocerciasis control project, Conakry, for one month's training with the Programme's Epidemiological Evaluation Unit, continuing the two months' practical training received in 1978;

- Dr Yaya Kasse, ophthalmologist, Director of the onchocerciasis control project in Kankan, continuing a 12 months' training period in ophthalmology begun in September 1978 with IOTA in Bamako;

- Mr Koho Raymond Kone, parasitologist, National Prevention Service, malaria project, Conakry, for two weeks' training in entomology with IRO in Bouaké, continuing the three-and-a-half months' practical training he received there in 1978;

- Mr Roger Lema, Professor of Biology, Faculty of Natural Sciences, Conakry, for two-and-a-half months' training in entomology with IRO in Bouaké, continuing the three-and-a-half months' practical training he received there in 1978;

- Mr Arsène Sagno, biologist, National Prevention Service, Conakry, for two-and-a-half months' training in entomology with IRO in Bouaké, continuing the three-and-a-half months' practical training he received there in 1978.

94. Three other Guinean fellows have started training courses in 1979:

- Mr Kabine Kaba, assistant entomologist;

- Mr Souleymane Kourouma, parasitologist; and

- Mr Théouna Oularé, assistant entomologist.

All three are employed on the onchocerciasis control project in Guinea. They have begun four months' practical training in entomology with IRO, Bouaké.

95. In 1979 two fellows from Niger continued the training courses they began last year:

- Mr Amadou Hamadi, auxiliary social worker, Niamey; and

- Mr Rahiou Labbo, animal husbandry assistant, Livestock Laboratory, Niamey.
Both underwent a two-week training course in entomology at IRO in Bouaké, continuing the three-and-a-half months' training they received there in 1978, and following two months' training in the entomology sectors of the Programme at Léma-Kara and Tenkodogo respectively. This training continued with five weeks' practical training in the Programme's entomology sector at Natitingou.

96. A third fellow from Niger, Dr Moussa A. Kabo, ophthalmologist at Niamey Hospital, began three months' practical training in ophthalmology at IOTA in Bamako in March.

97. A fellow from Tanzania, medical officer in the Ministry of Health in Dar-es-Salaam, began four months' training in entomology with IRO in Bouaké in February. This will be followed by six weeks' practical training within the Programme.

98. A Togolese fellow, Mr Ketevi Koumouvi, assistant entomologist in the Major Endemic Diseases Service in Lomé, received one month's training in entomology with IRO in Bouaké, continuing the three-month training period he spent there in 1978. This was preceded by three months' practical training in the Programme's entomology sector in Bobo-Dioulasso.

99. A fellow from Benin, Mr Gilbert Mensah, responsible for entomological research in the Cotonou Entomology Unit, underwent one month's training in hydrobiology at the ORSTOM Laboratory in Bouaké, continuing the five months' practical training he received there in 1978.

100. A fellow from Sierra Leone, Mr Haruna Sesay, medical entomologist with the Ministry of Health of Sierra Leone, who was on a study mission, spent two weeks with the Programme and one week with IRO in Bouaké.

101. A fellow from the Congo, Mr André Yebakima, entomologist, was to receive three weeks' training in March on insecticides at IRO in Bouaké.

102. Three technicians from the Programme's Epidemiological Evaluation Unit, Mr Jean-Baptiste Batino, Mr Sylvester Lombo, and Mr Dadi Madiega, underwent a two-week refresher training course with IOTA in Bamako in January.

103. A refresher training session on the identification of the different species of S. damnosum was held in the Seguélá subsector in Ivory Coast from 26 February to 18 March for the benefit of subsector heads from Mali, who attended in turn.

104. At the request of the Mali Minister of Education, a student at the Advanced Teacher Training College in Bamako who is preparing a dissertation for his Master of Science degree, Mr Oumar Samake, received practical training in entomology in the Bamako sector during the first quarter. He also visited the Bougouni and Sikasso subsectors and took part in field activities.
105. Dr Le Du, WHO medical officer employed in project AFRO/MPD/004, malaria and other parasitic diseases, as a continuation to the two months' practical training received in 1978 in the Programme's Epidemiological Evaluation Unit, received two weeks' refresher training with IOTA in Bamako, followed by one month's training at the Bamako School of Medicine, and then resumed his practical training with the Programme's Epidemiological Evaluation Unit.

106. In February the Programme Director received from the Minister of Public Health and Social Affairs of Mali a list of nine candidates for a specialist training fellowship in:
   - epidemiology
   - medical entomology
   - hydrobiology
   - ichthyology

Background information on the candidates has been requested.

107. An internal meeting on practical training in onchocerciasis and vector control within the Programme was held in February. The types of training provided by the Programme, the standards required to qualify for it, and the duration and most favourable period for these various types of training were considered. The Vector Control Unit is capable of organizing a maximum of 40 weeks' practical training for English-speaking students and 120 weeks for French-speaking students. The Epidemiological Evaluation Unit should be able to organize courses for 1 to 10 people annually for average periods of three months.

108. The Programme also received a request for an observation visit to be made by Dr A.P. Moraes of the Evandro Chagas Institute, Belém, Para, Brazil. Dr Moraes is the author of many publications on onchocerciasis in Central and Latin America and has very wide field experience.

D. ADMINISTRATION

Budget and finance

109. As at 31 March 1979 expenditure during the first quarter amounted to $1,924,570 and obligations amounted to $7,962,891. This brought the total expenditure committed up to 31 March to $9,887,461, or 71.1% of the budget of $13,895,200 approved for 1979.

110. On 8 March, Benin made a payment of 6,229,000 CFA francs, representing its contribution to the Programme for the years 1974-1978.

Personnel

111. On 31 March 1979 there was a total of 693 general service staff for 743 authorized posts, and 43 professional staff for 50 authorized posts.
112. Mr F. Gueguedegbo, an entomology technician of Beninese nationality seconded by his Government, previously assigned to the MURAZ Centre in Bobo-Dioulasso, took up his duties on 4 January as an entomology technician in the Natitingou sector in Benin. Mr K. Koumouvi, an entomology technician of Togolese nationality also seconded by his Government, and previously attached to the Major Endemic Diseases Service, took up his duties as head of Dapaon subsector on 16 January.

113. Four consultantships were served during the quarter: Mr A. Akpoboua, an entomologist of Togolese nationality, after a two-week familiarization period with Dr Raybould at Akosombo, was to assist for three months in studies on possible extension in Ghana; Dr A. Holland, an ophthalmologist of French nationality, began a three-month consultanship in mid-January and assisted the Epidemiological Evaluation Unit in Ivory Coast and Benin; Dr S.M. Omar, an entomologist of Egyptian nationality who is spending two-and-a-half months in the Programme area, is continuing a study on the parasite which he began last year; finally Dr D. Kurtak, an entomologist from the United States, began a three-month consultanship within the Vector Control Unit on 26 March.

114. In January the Programme received the new salary scales for local staff employed in Niger and Ivory Coast. These came into effect on 1 March 1978 in Ivory Coast and on 1 July 1978 in Niger. In Ivory Coast, where the previous revision of salary scales was on 1 June 1977, the increases range from 7% to 13%, while in Niger, where the previous increase was on 1 February 1976, the increase vary from 2% to 5%. These increases do not exceed our budget estimates. Surveys have been undertaken with a view to raising the local salary scales in Mali and Ghana. These would come into effect as from 1 October 1978. The situation concerning salary scales and reviews in progress on 31 March 1979 was as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Review</th>
<th>Date of entry into force</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivory Coast</td>
<td>No. 12</td>
<td>1 March 1978</td>
<td>Survey in progress</td>
</tr>
<tr>
<td>Niger</td>
<td>No. 6</td>
<td>1 July 1978</td>
<td>Survey completed and passed on to UN for establishment of salary scales. Date of entry into force: 1 May 1978</td>
</tr>
<tr>
<td>Benin</td>
<td>No. 4</td>
<td>1 April 1977</td>
<td></td>
</tr>
<tr>
<td>Togo</td>
<td>No. 7</td>
<td>1 February 1977</td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>No. 16</td>
<td>1 July 1977</td>
<td></td>
</tr>
<tr>
<td>Upper Volta</td>
<td>No. 4</td>
<td>1 January 1976</td>
<td></td>
</tr>
<tr>
<td>Mali</td>
<td>No. 2</td>
<td>1 January 1977</td>
<td></td>
</tr>
</tbody>
</table>
115. The annual verification of dependants of staff employed by the Programme is under way. This covers 524 employees and 1955 notified dependants.

116. The next United Nations language examination for general service staff will be held on 29 May for French and 31 May for English.

117. During the quarter the personnel department drew up eight new contracts and renewed 45. The employment of four staff members was terminated, two by resignation and two for misconduct.

**General services**

118. The installation of the Director's office, the units and the various services in the new building was practically completed by the end of January. The Ouagadougou subsector was installed in the same premises as the central garage and the lease on the building accommodating this sub-sector was terminated. Preliminary notice was also given of the termination at the end of March of the lease on the building previously accommodating the budget and finance department.

119. The simultaneous interpretation equipment and the services of a Programme technician were loaned from 16 to 19 January to the Upper Volta Ministry of Planning and Cooperation and from 22 to 25 January to the Post and Telecommunications Office.

120. Since the technicians responsible for repairing the radio stations in the Programme area are being called out more and more frequently, an analysis was made of breakdowns that occurred during the last six months and showed that 60% of them were due to fluctuations in current. As an experiment a voltage regulator was installed in the Bobo-Dioulasso station. The results of this experiment were conclusive, and regulators have been ordered for all the Programme's radio stations. Analysis of the other breakdowns is in progress.

121. An official from the Regional Office, Mr Ayina, EEM/AFRO, came to assist in installing the telephones in the new building. The initial mistakes in installation were rapidly corrected and the four lines are now operating.

122. During the quarter the General Services processed 146 travel authorizations and obtained 57 travel documents and 23 visas.

**Building**

123. The headquarter building was provisionally accepted on 15 February and an official report was drawn up.

124. The work to complete the conference room is in progress. At present the electrical circuits and the air conditioning are being installed. As soon as the air conditioning has been installed the ceiling and floor covering will be fitted. We are still awaiting some of the interpretation equipment. Some delay in the completion of this room is likely.
125. A call for tenders has been issued for the construction of the annex which will accommodate the General Services stores and the office of the Supplies Service. Tenders should be submitted by 30 April.

126. Work on the construction of a bodywork and painting workshop in the garage began on 14 February.

127. The store for the Supplies Service has now been completed and the work has been paid for. The cost exceeds the estimates by 6%. This excess is attributable to the electrical fittings and to the changes made to the initial project so that VOU and EPI equipment can be stored separately. The cost of the building amounts to 31,273 CFA francs per square metre.

Supplies Service

128. Requests for exemption from duty and tax on fuel in 1979 were submitted in each of the participating countries.

129. All inventories in the sectors and subsectors were checked.

130. In addition to its routine activities concerned with the ordering, acceptance and customs clearance of supplies, this Service assisted in the lengthy formalities for recovering the import duty paid by Viking in 1977 to the Customs Department in Bobo-Dioulasso.

Transport Service

131. A review of the state of the vehicle fleet in the sectors reveals great fatigue in the oldest vehicles. Throughout the Programme area, 92 of the 276 vehicles went into service in 1975 or earlier. The workshops are finding it increasingly difficult to deal with the breakdowns, which are becoming more numerous, and with the necessary general overhauls.

132. At the end of the quarter 152 vehicles were needed to meet the needs of the sectors and only 61% of these were in running order. As spare vehicles were being used to replace them, the needs are at present being met. However, it is clear that any further deterioration in the equipment will jeopardize the smooth running of operations.

133. Ten accidents were notified during the quarter. No one was hurt, but one accident caused considerable material damage.

Sectors and subsectors

134. The new subsector for studies in the extension area in the Brong Ahafo Region of Ghana became operational on 5 March in temporary accommodation at Kintampo. This subsector absorbed the staff from the Bole subsector, also in Ghana, which closed on 28 February.

135. Two administrative seminars were held, one at Bouaké from 19 to 24 February for staff in the western zone, the other at Ouagadougou from 26 to 30 March for staff in the eastern zone. They were attended by heads and clerical staff of the sectors and by the subsector heads, together with the officials in charge of the Finance, Personnel, Supply and Transport Services and the Chief of Administrative Services.
III. SECOND PHASE: 1980-1985

Financing

136. At the invitation of the World Bank, an initial meeting of contributing parties was held in Paris on 30 and 31 January to prepare the Second Phase of the Programme's operations. The agenda included the financing of this Second Phase, the next aerial contract, the Commission on long-term prospects, and legal and institutional arrangements. Mr Bilsel Alisbah, Director, Programmes I, World Bank Regional Office for West Africa, took the chair. The meeting was attended by representatives of the African Development Bank, Belgium, Canada, France, the Federal Republic of Germany, Japan, Kuwait, the Netherlands, Norway, Saudi Arabia, the United Kingdom, the United States and the four sponsoring agencies - the World Bank, UNDP, FAO and WHO - together with representatives of Switzerland and the European Commission.

137. The response of the contributing parties was extremely positive, and on the basis of the declarations made in Paris about 65% of the funds needed to finance the Second Phase can already be counted on. The World Bank is prepared to double its contribution. It also intends to contact potential new donors such as some Scandinavian countries, Switzerland and some Arab countries.

138. Stress was again laid on the importance of the payment of their own contributions by the participating Governments. A total of 59 775 000 CPA francs for the First Phase (1974-1979) was still due from five of these Governments at the end of January. A new formula for calculating these contributions, based on the gross national product and the percentage of people directly benefiting from the Programme in each country, is to be proposed by the World Bank for the Second Phase.

139. The draft agreement on legal and institutional arrangements was examined and approved and was to be submitted to the participating Governments at the third meeting of national committees in Bamako.

140. The next meeting of contributing parties will be held on 29 and 30 May in Paris.

141. A World Bank mission consisting of Mr B. Alisbah and Mr S. Denning, Director of Programmes and Divisional Chief for the West African Region respectively, visited the Programme early in February. At an information session with the staff of the Programme they reported on the progress of negotiations to finance the Second Phase, the contributions expected from the participating Governments, and the procedure to be followed in granting the third aerial contract.

142. At the end of February the World Bank informed the Programme that Japan intended to send a three-week fact-finding mission to the Programme area before the next meeting on the financing of the Second Phase. This mission would consist of Dr Hayashi Shigeo, Mission Leader, Director of the Division of Parasitic Diseases in the National Health Institute of Japan; Dr Tanaka Hiroshi, Professor at Tokyo University, Institute of Medical Sciences, Division of Parasitic Diseases; Dr Ogata Kazuki, Director of the Scientific Research Centre for Environmental Health; and a diplomat from the Ministry of Foreign Affairs or the Japanese Embassy in Abidjan. This mission is to visit the Programme area during the second and third weeks of May. The Programme for the visit is being prepared.
Contributions from the governments of participating states

143. The new formula for calculating the contributions of participating states during the Second Phase is based essentially on the gross national product of the countries and the percentage of inhabitants benefitting directly from the Programme in each country. Coefficients of 70% and 30% will be applied to these two factors respectively. Although population and Programme expenditure are also taken into account in these calculations, the major criterion remains income, i.e. the capacity to pay.

144. The total contribution of African governments would amount to $1 440 000, which would represent 1.08% of the cost, the same as their percentage contribution to the First Phase.

145. On the basis of GNP per capita and the number of beneficiaries in each country, the individual countries' contribution for the six years of the Second Phase would amount to:

<table>
<thead>
<tr>
<th>Country</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benin</td>
<td>$122 000</td>
</tr>
<tr>
<td>Ghana</td>
<td>250 000</td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>430 000</td>
</tr>
<tr>
<td>Mali</td>
<td>120 000</td>
</tr>
<tr>
<td>Niger</td>
<td>83 000</td>
</tr>
<tr>
<td>Togo</td>
<td>270 000</td>
</tr>
<tr>
<td>Upper Volta</td>
<td>170 000</td>
</tr>
</tbody>
</table>

Third aerial contract: 1980-1982

146. Following talks in Ottawa last October between representatives of the Canadian Commercial Corporation, Viking Helicopters Ltd and the Programme Director, the World Bank agreed in principle to the opening of direct negotiations to establish the next aerial contract for the period 1980-1982. However, the new contract should remain within the limit of 19 440 guaranteed hours and the cost of each additional hour should not exceed the average unit cost for the main contract. Moreover, the contract should contain no price increase clause for any part of the period. Negotiations along these lines were due to begin in the first week of February with representatives of the Canadian Commercial Corporation and the Viking Company at WHO headquarters in Geneva.

147. However, following the meeting of the contributing parties held in Paris on 30 and 31 January it was decided to follow the customary procedure and issue an international call for tenders for the contract. This was to be announced during the last week of February in “Flight International”, “Aviation Week”, “The International Herald Tribune”, “Le Monde” and “Die Welt”. Companies interested should indicate their intention of submitting a tender by 6 April. Those short-listed would be invited to visit the Programme area in late April or early May.

148. The first meeting of members of the selection committee for the contract was held in Geneva on 21 February. A second meeting was held on 15 and 16 March.
149. The intention to submit a tender should be notified to WHO headquarters by 6 April and documents concerning the contract should be sent to the companies short-listed on 12 April.

Memorandum of Understanding

150. An initial text of a Memorandum of Understanding, describing the institutional and operational arrangements for the Programme during the period covered by the Second Phase, has been drawn up. This draft was to be submitted to the participating countries for consideration at their meeting in Bamako at the end of April.

Commission on the long-term prospects of the Programme

151. The first six-year phase of the Onchocerciasis Control Programme, launched in 1974 as a 20-year operation, comes to an end in 1979. An evaluation of this First Phase conducted in 1978 confirmed that the control measures are based on a sound and effective strategy. However, the evaluation report highlighted the fact that control would have to continue beyond the 20 years initially envisaged and that the financial demands of the Programme might exceed available resources. In fact budget estimates for the Second Phase total US $133 million, as against less than $60 million for the First Phase. While the economic benefits of the Programme are recognized, their cost and the future prospects cannot be ignored.

152. In his address at the opening meeting of the fifth session of the Joint Coordinating Committee in Lomé last December, Dr Mahler announced the decision to set up an independent commission, the main role of which will be to develop a better cost-effectiveness ratio for the operations and to determine whether there are any simpler technologies better adapted to the human and financial resources of the participating African countries.

153. Following meetings on 9 and 26 January 1979 between the Programme Director and Dr C.E. Gordon Smith, Dean of the London School of Hygiene and Tropical Medicine, Dr Mahler, by letter of 22 February, invited Dr Gordon Smith to accept the chairmanship of the Commission, the terms of reference of which are as follows:

1. To review alternative technologies appropriate to the area of operations and determine which may be implemented in the Programme and at what time.

2. To consider the role of chemotherapy, whether as complementary to vector control or for maintenance.

3. To evaluate the possible influence of extending vector control beyond the present OCP area on the Programme as it now operates and on the reinvasion phenomenon.

4. To determine to what extent the Programme could incorporate the control of other vector-borne diseases into its operations.

5. To recommend what research should be undertaken during the second financing phase in relation to (1) and (4) above and which could result in a more cost-effective approach.
6. To identify the type of structures, national and international, that will be required in future to carry on the Programme's activities in the manner and at the level to be recommended; to define the type and magnitude of training input that will be called for in this respect.

154. In a meeting which took place at WHO headquarters, Geneva, on 23 February, Dr Gordon Smith informed Dr Mahler of his acceptance of the chairmanship, and officially confirmed this in a letter dated 28 February.

155. It was agreed that the Commission would have a core membership of eight. A provisional list of members was drawn up jointly by WHO and the Chairman. At the time of the Chairman's meeting with the Programme Director on 2 April, seven of the eight members had been approached and had accepted, as follows:

Dr A. Diallo (Mali), Director General of Public Health, Ministry of Public Health, Bamako

Mr J. Dewilde (Netherlands), formerly Chief Economist, World Bank, Washington

Mr D. Lindores (Canada), Director, United Nations Programmes Division, Canadian International Development Agency

Dr H. Jambeck (United States of America), Director, Science Services, University of the State of New York, New York State Museum and Science Service, Albany, New York

Dr P. Hamilton (United Kingdom), Director, Caribbean Epidemiology Centre, P.O. Box 164, Port-of-Spain

Dr W.G. Wolman (United States of America), Chairman, Department of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, Maryland

Dr P. Kessler (Federal Republic of Germany), Kornwegerstrasse 3, 8000 Munich 55

156. The Commission will create subgroups for the study of specific topics as follows:

(a) vector control: alternative technologies, insecticides and other control agents, best possible use of the aerial fleet;

(b) extension of vector control further south and west of the OCP area and logistic arrangements (national structures, training);

(c) multi-disease control: possible role of the Programme in assessment and control of other major health problems in the region; possible use of present Programme infrastructure; interest of research on the development of new filaricides;

(d) evaluation and monitoring: entomological, including vectors other than Simulium; epidemiological, with attention to diseases other than onchocerciasis;

(e) the future: national structures to be set up; timetable for handing over the Programme's responsibilities to the beneficiary countries; preparation of a programme of appropriate training of nationals.
157. The first meeting of the Commission will take place in Ouagadougou from 14 to 18 May. The objectives of this meeting are to examine the present state of knowledge in relation to the terms of reference, to agree on a programme of action, to determine in detail the terms of reference of the subgroups, their membership and programmes of work, and to identify needs for additional information, studies and consultants.

158. A report on the establishment of the Commission will be made by the Programme Director to the third meeting of National Onchocerciasis Committees in Bamako from 24 to 26 April. Following the May meeting of the Commission, information on its aims, members and work programme will be circulated to all members of the Joint Coordinating Committee; also, a paper will be prepared for presentation to the second meeting of donors in Paris on 29-30 May.

159. It is planned that the Chairman will visit each of the participating countries in the autumn to discuss the work of the Commission with the national authorities. A second full meeting of the Commission will take place in Geneva at the end of November, prior to the sixth session of the JCC which the chairman will attend.

160. The Commission will submit a draft report to WHO in June 1980. The final report is to be completed by June 1981 for presentation to the Joint Coordinating Committee at its eight session in December of that year.

161. The Commission's budget, which covers three years and includes the cost of meetings of the Commission and its subgroups, travel, consultants and preparation of the final report, totals approximately $500 000 per year. The Programme hopes to make enough savings on its own budget in 1979 to allow it to advance the funds needed for the work of the Commission, at least in the first year. The question of financing the Commission will probably have to be discussed in detail at the next session of the JCC in December 1979.

IV. OTHER ACTIVITIES

Meetings

162. The timetable of forthcoming meetings at the end of the quarter was as follows:

- National Onchocerciasis Committees, third meeting, 24-26 April, Bamako;
- Commission on long-term prospects, first meeting, 14-18 May, Ouagadougou;
- Contributing parties, second meeting, 29- and 30 May, Paris;
- Steering Committee, 26th session, 27-29 June, New York (dates subject to confirmation);
- Scientific and Technical Advisory Committee, 8th meeting, 4-7 September, Geneva;
- Steering Committee, 27th session, 12-14 September, Geneva;
157. The first meeting of the Commission will take place in Ouagadougou from 14 to 18 May. The objectives of this meeting are to examine the present state of knowledge in relation to the terms of reference, to agree on a programme of action, to determine in detail the terms of reference of the subgroups, their membership and programmes of work, and to identify needs for additional information, studies and consultants.

158. A report on the establishment of the Commission will be made by the Programme Director to the third meeting of National Onchocerciasis Committees in Bamako from 24 to 26 April. Following the May meeting of the Commission, information on its aims, members and work programme will be circulated to all members of the Joint Coordinating Committee; also, a paper will be prepared for presentation to the second meeting of donors in Paris on 29-30 May.

159. It is planned that the Chairman will visit each of the participating countries in the autumn to discuss the work of the Commission with the national authorities. A second full meeting of the Commission will take place in Geneva at the end of November, prior to the sixth session of the JCC which the chairman will attend.

160. The Commission will submit a draft report to WHO in June 1980. The final report is to be completed by June 1981 for presentation to the Joint Coordinating Committee at its eight session in December of that year.

161. The Commission's budget, which covers three years and includes the cost of meetings of the Commission and its subgroups, travel, consultants and preparation of the final report, totals approximately $500 000 per year. The Programme hopes to make enough savings on its own budget in 1979 to allow it to advance the funds needed for the work of the Commission, at least in the first year. The question of financing the Commission will probably have to be discussed in detail at the next session of the JCC in December 1979.

IV. OTHER ACTIVITIES

Meetings

162. The timetable of forthcoming meetings at the end of the quarter was as follows:

- National Onchocerciasis Committees, third meeting, 24-26 April, Bamako;
- Commission on long-term prospects, first meeting, 14-18 May, Ouagadougou;
- Contributing parties, second meeting, 29-30 May, Paris;
- Steering Committee, 26th session, 27-29 June, New York (dates subject to confirmation);
- Scientific and Technical Advisory Committee, 8th meeting, 4-7 September, Geneva;
- Steering Committee, 27th session, 12-14 September, Geneva;
- Ecological Panel. The Programme Director has agreed that the meeting of the Ecological Panel and the annual meeting of hydrobiologists should be held in Salford, United Kingdom, where the data on environmental surveillance collected in the Programme area are analysed. The meeting of the Ecological Panel would immediately follow the meeting of hydrobiologists and would permit an in-depth analysis of the ecological impact of the insecticide. The meeting of hydrobiologists could be held from 24 to 26 September and the 9th meeting of the Ecological Panel on 27 and 28 September.

163. At the invitation of Dr S. Flache, Assistant Director-General, TDR coordinator, the Programme will take part on 12 and 13 December in the second meeting of the Joint Coordinating Board of the Special Programme for Research and Training in Tropical Diseases.

164. The Programme replied favourably to the request from the WHO Expert Advisory Panel on Trachoma and the Prevention of Blindness to hold its next meeting in Ouagadougou from 18 to 22 February 1980.

165. The Programme was to attend the meeting of financial backers of the Liptako-Gourma Authority scheduled to take place in Ouagadougou on 9 and 10 April.

166. The Programme Director was due to attend a symposium in Belgium on 20 and 21 April on health in the developing countries, organized by the Janssens Foundation. He was to speak on the economic aspects of the Programme.

Third meeting of National Committees, Bamako

167. At the end of February the Programme and the Mali authorities finalized the practical arrangements for the meeting. In March the Programme Director paid visits to each of the participating Governments except Ghana, which could not be visited because its frontiers were closed. The discussions covered the activities of the Programme and the agenda for the Bamako meeting, particularly the financing of the Second Phase and the contributions of participating countries to the Second Phase.

Data recording and processing

168. After a thorough examination of the needs of the Programme for the recording and processing of epidemiological and entomological data, steps have now been taken to recruit a statistician.

169. Moreover, in order to reduce the cost of recording these data, it has been decided to entrust the card-punching work to a specialist company in France on a trial basis. The first work performed by the company has proved satisfactory in respect of quality, price and speed.
Advancement and rehabilitation of the blind

170. Following a survey carried out in December 1977 by Mrs A. Audibert in the capacity of Programme consultant, a number of ideas concerning the preparation of a national programme for the employment of the people with impaired sight was submitted to the appropriate services. Although campaigns on their behalf are conducted in Upper Volta, there is no national association for the blind in Upper Volta as there is in the other participating countries.

171. To remedy this state of affairs and grant the visually handicapped their proper place in society, the Ministry of Social Affairs is planning to hold a seminar, mainly for the purpose of establishing legislation on the visually handicapped. In January the Programme's public health adviser and the Director of Social Affairs visited the Prime Minister of Upper Volta, who is taking a special interest in this question. The seminar will be held under his patronage.

172. The dates 16 to 19 October were selected for the organization of this seminar in Ouagadougou. Over 15 institutes and international agencies interested in the blind and visually handicapped will be invited to the seminar. The Programme has offered to make available to the Ministry of Social Affairs its conference room, its simultaneous interpretation equipment, and if necessary a technician to take charge of this equipment.

173. Sir John Wilson, President of the International Agency for the Prevention of Blindness, accompanied by Mr Wolfgang Stein of the Christoffel Blindenmission, will visit the Programme in mid-August.

Information

174. Information sessions were organized for visitors from abroad, for educational establishments in Ouagadougou and Bobo-Dioulasso, and for the International Women's Club in Ouagadougou. A scientific information seminar was also organized at WHO headquarters in Geneva.

175. Interviews were given to Jacques Maunick of Radio France Internationale, to Dr Joseph Hanlon, a freelance reporter specializing in development problems, to Stan Sherer of Associated Press, and to Mathias R. Schmidt of the Federal Republic of Germany for the preparation of radio programmes in German. Within the next few weeks we are expecting visits from two journalists from the Sunday Times, a journalist from the SIGMA press agency, and from a BBC reporter, Mr Ahmed Rajab.

176. The Programme assisted in preparing a programme for the National Information Week on Onchocerciasis planned in Benin from 14 to 20 May.
177. We have also contributed to the preparation of press articles, including two articles by Dr Watson (one of which was published in February and the other of which was to be published in the March issue of the British magazine "Africa Health"), and to the preparation of audiovisual programmes such as the one prepared by USAID to illustrate its activities in Upper Volta or the one prepared by the "World Neighbours" based in Togo to assist their staff in their work in rural areas.

178. The Programme permitted the filming of air operations in Ivory Coast to illustrate the role of health in economic development for a film on the construction and establishment of the Borotou-Koro sugar complex. A copy of this film should be received for our collection. In January we also received the French version of the BBC film "Country of the blind".

179. Several projects are in progress:

- We have begun to build up a series of some 80-90 slides which could be reproduced as microfiches for information purposes abroad.

- A new poster on the Programme has been designed. It is in colour and includes about eight black-and-white photographs. The poster is at present being printed and should reach us shortly. We have ordered 1000 copies for each participating country. The poster could be distributed to all the schools.

- At the suggestion of General Joumiac, French delegate to the meeting of donors in Paris in January, we are intending to introduce a prize which could be awarded to a laboratory, an institute, a research worker, a journalist, a film director or anyone else who has in some way served the Programme well by assisting it directly or indirectly in reaching its objectives. This project is under study.

- Finally, a circular letter was sent out on 12 March to all addressees of Oncho-Flash with a view to the preparation of a booklet about the Programme on the "question and answer" pattern.