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REPORT
of the
FOURTEENTH SESSION OF THE
EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

held in
Rome, Italy
14 - 16 March 1967

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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INTRODUCTION

The XIVth Session of the European Commission for the Control of Foot-and-Mouth Disease was held on 14 - 16 March 1967 under the Chairmanship of Professor R. Gaier.

Dr. Sen, Director-General, Food and Agriculture Organization addressed the assembly. He welcomed all the representatives of the various countries, international organizations and institutions and especially the delegates and observers who were taking part in the work of a Session for the first time. He stressed the importance of foot-and-mouth disease to the European economy and the interest taken by countries within and outside Europe in the international problems arising from the presence of the disease.

The annual review of the position at the Sessions of the Commission was fully justified and provided much needed information on the often frequent and sudden changes in the disease situation, leading to future activities on the control of the disease. Much excellent and timely service on information is also rendered by the O.I.E.

Compulsory annual vaccination of cattle, now being more widely practised, is resulting in the progressive decrease in the incidence of the disease and progress is being made with efficient vaccines to protect swine.

The financial, material and other support of Governments and the E.E.C. has enabled two epizootics in south-eastern Europe to be halted at the relatively low cost of US\$ 4,000,000 distributed over nearly five years. The results of the campaigns against the disease have amply proved the usefulness of the European Commission. The recent FAO Regional Conference for Europe, held by this Organization in Seville (5-11 October 1966) has endorsed the initiatives so far undertaken in controlling foot-and-mouth disease in south-eastern Europe and called for more action in order to consolidate the results already achieved and possibly to extend the benefits of the vaccination campaigns further East.

The Food and Agriculture Organization will give all possible assistance to further the activities of the Commission which may be decided upon.

Dr. R. Gaier (Chairman) thanked the Director-General for his address and for his continuous interest in the work of the Commission and his suggestions for future activities. Dr. Gaier also welcomed all those present and extended a special welcome to those attending a Session for the first time. He drew attention to the retirement of Dr. A. Ademollo from the Italian Veterinary Service and therefore as the delegate of Italy to the Commission, thanking him for the active support he has given over many years.

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I. ADOPTION OF THE AGENDA

The following agenda which has been circulated was adopted:

1. Adoption of Agenda
2. Position of foot-and-mouth disease in Europe since the last Session
3. Position of foot-and-mouth disease in the Near East and Northern Africa
4. Campaigns against exotic foot-and-mouth disease viruses in south-eastern Europe and Anatolia
5. Report of the Executive Committee and activities of the secretariat
6. Administrative budgets and accounts - Revision of scale of contributions
7. Election of Chairman
8. Election of Vice-Chairman
9. Election of Executive Committee
10. Any other business.

II. POSITION OF FOOT-AND-MOUTH DISEASE IN EUROPE SINCE THE LAST SESSION

An introduction to this subject, together with tables showing statistics of outbreaks reported in Europe and types of virus identified since the last Session in Europe, the Near-East and North Africa will be found in Appendix I.

Information on the position in the different countries of Europe during this period was given by the various delegations.

Ireland

There has been no foot-and-mouth disease since 1941. Vaccination against the disease is not practised and the Government applies all precautionary measures against the introduction of the infection.

United Kingdom

After a period of four years during which only one isolated outbreak of foot-and-mouth disease had occurred in Great Britain, the disease appeared in Northumberland in July 1966 in a district heavily stocked with grazing cattle and flocks of hill sheep. Because four herds in the area were simultaneously affected at the beginning, an infected area (in which the movement of animals is allowed only on license) of approximately 25 miles radius from the centres of infection was declared. Three operational centres, with 60 whole-time veterinary officers, were set up in the infected area and very strict control of animals was enforced. There was good cooperation and early reporting of suspicion of the disease by livestock owners. There was large-scale destruction of animals and disposal of carcasses by burial or burning, as well as thorough cleaning and disinfection of buildings on infected farms, and destruction of feeding stuffs considered to be dangerously contaminated.

In all, there were 32 outbreaks in the epidemic, in which 5,753 cattle, 38,445 sheep and 714 pigs were slaughtered and £945,107 paid to the owners as compensation. Following the last case on 5 September, restrictions were withdrawn on 27 September. The virus was type O₁ and the source of the infection was not established.

On 28 September, foot-and-mouth disease was confirmed in one cow in a cattle herd near Pulborough, Sussex, and virus type A₂₂ was identified. A further outbreak occurred in cattle on a farm eight miles away which had been visited by the owner of the first farm a few hours before the disease in his herd was confirmed. The usual "infected area" was imposed and all affected and susceptible animals on both farms were slaughtered and the carcasses buried. There was no further spread. In all, 211 cattle, 159 sheep, 4 pigs and 2 goats were destroyed, £17,678 being paid in compensation to the owners. The source of the infection was not established.

On 6 January 1967, foot-and-mouth disease was confirmed in two cows in a cattle herd at Southwick, Hampshire, and virus type O₁ was identified. Up to 3 February the disease was confirmed on 29 farms and restrictions imposed on 6 January, were withdrawn on 24 February. In all, 170 cattle, 285 pigs and 4 sheep developed the disease and 2,774 cattle, 4,708 sheep, 414 pigs and 6 goats were slaughtered. Because most of the affected pigs had been purchased at two markets, immediate tracing of animals from the markets was carried out, but there was no evidence of the disease

among other animals which had passed through them. Spread was mostly local. This epidemic is believed to have begun in a swill-fed pig herd and it is considered that the infection may have been introduced in the swill which, it is known, would have contained meat scraps of South American origin.

Northern Ireland has been free from foot-and-mouth disease during this period.

Iceland

The disease has never been introduced into this country.

Norway

The country has been free from foot-and-mouth disease during the period.

Finland

There has been no foot-and-mouth disease in Finland since 1959.

Denmark

At the last Session of the Commission an account was given of the epizootic which occurred in the south-eastern part of Sealand. Despite all the measures taken to control the disease and vaccination carried out on cattle in all counties east of the "Great Belt", sporadic outbreaks continued to occur, from April until 21 May. In the meantime, 500,000 cattle in the southern part of Jutland were vaccinated and for this purpose vaccine had to be imported from the French Institute at Lyons. This measure was intended to prevent the spread into Denmark of infection which was present at the time in Schleswig Holstein, North of the Kieler Kanal.

To sum up, 39 outbreaks, all caused by virus type O, were diagnosed during a period of 3 months from February to May.

Stamping-out was always applied when pigs and unvaccinated cattle were affected. In all, 900 head of cattle, 2,806 pigs and 4 sheep were destroyed, and 2,400,000 Danish Kroner were paid in compensation to farmers.

During 1966, vaccination was carried out in 1,300,000 head of cattle. All the various vaccines used gave excellent results. The Government expenses for vaccination (vaccine plus salaries to the veterinarians) amounted to 6,500,000 Danish Kroner.

The ordinary veterinary police measures were supplemented by temporary precautions including prohibition of export of live and slaughter cattle from the islands and also movement of cattle and pigs from the islands to Jutland.

In the second half of the year, the situation remained quiet; at the beginning of January 1967, however, an isolated outbreak occurred among pigs on the island of Lolland. The herd, including cattle and pigs, was stamped out and 50,000 cattle on the same island were vaccinated.

A new situation arose in February when 38 outbreaks of type O were reported in Schleswig-Holstein, north of the Kieler Kanal. In view of the

danger of the disease penetrating into Denmark, the vaccination of 750,000 cattle in the exposed part of the country was decided and is in full swing at the present time.

Sweden

On 6 March 1966, foot-and-mouth disease was found in a cattle herd at Norra Nöbbelöv in the county of Malmöhus, 5 miles from the coast and 45 miles from the nearest outbreak of the disease in Denmark. Up to this time there had been 14 outbreaks in Denmark, all on the southern part of Sealand and islands to the south of Sealand. Following confirmation of the disease by the laboratory at Lindholm, the 23 cattle and 43 pigs on the farm were slaughtered and the carcasses buried. Movement restrictions were applied in the area and dairy products for animal feeding were required to undergo high-pasteurisation.

Vaccination of 609 cattle in 25 herds within the area was carried out with C(Lausanne) type vaccine, supplied from Lindholm and Brescia and a week later a further 6,688 cattle in 54 valuable herds and insemination centres were also vaccinated. There were no further cases. The origin of the infection was not established.

Tests carried out with sera of 14 people, consisting of the family present on the affected farm, inseminators and veterinarians, revealed antibodies only in the case of the owner who, undoubtedly picked up virus by contact with the infected animals. Virus was not recovered.

France

Between January 1966 and the end of February 1967, there have been two enzootics - one in January-February 1966 and the other between November 1966 and January 1967. Between the two, there were two suspected outbreaks and the animals were slaughtered but the disease was not confirmed.

The first enzootic, caused by virus type C was mostly in pigs and affected 19 establishments in 5 departments (Corrèze, Gironde, Lot, Dordogne, Indre et Loire, Haute Vienne). The origin was probably imported pigs slaughtered in a Corrèze abbatoir. The vaccinated cattle in the establishments resisted the disease well. In all, 225 cattle, 190 sheep and goats and 509 pigs were slaughtered.

The second enzootic affected mostly cattle and began concurrently in the departments of Haute Loire and Les Ardennes in which it spread as well as to other departments. There were 37 outbreaks in 13 departments (Haute Loire, Ain, Ardennes, Aube, Territoire de Belfort, Yonne, Cantal, Marne, Tarn et Garonne, Vaucluse, Loire, Cher and Loiret). The source of the infection was certainly outside France for virus O₁ which caused the outbreaks had not previously been found in France.

The O vaccine in use was very effective, without doubt because it contained O virus found at the Franco-Spanish frontier in 1964, which is very similar to type O₁. It was recommended to carry out the annual vaccinations earlier than usual and in 1966, 19 million cattle doses of vaccine were used. In this second enzootic, 1,270 cattle, 1,121 sheep and goats, and 193 pigs were slaughtered.

The following measures were also applied in the two enzootics: prohibition of fairs and markets; prohibition of susceptible animals

leaving the affected departments; very strict disinfection.

By 17 December the enzootic which had lasted about a month was over, but on 2 January 1967 the disease appeared in the South of France where there were five outbreaks in the town of Marseilles, Departement Bouches du Rhône. Only pigs were affected : 1,680 pigs were slaughtered. Compulsory vaccination was carried out in all the pigs in the departement. There was also an outbreak in the second half of February in a piggery at Var, which was probably an extension of the disease from the above outbreak : 60 pigs were slaughtered. In both these outbreaks, virus type C was identified.

Luxembourg

The country was free from foot-and-mouth disease during the period.

The Netherlands

The last case of the epizootic caused by virus type C in the winter and spring of 1966 occurred on 18 May 1966. There were no further outbreaks until November 1966. During the interval of freedom from the disease, preparations were made for the early ring vaccination of pigs whenever outbreaks occurred, using concentrated vaccine. It was arranged that immediately on the occurrence of an outbreak, all the pigs in an area of about 2 miles around the infected place would be compulsorily vaccinated. It was arranged that a number of veterinarians in practice would undertake the vaccinations without delay.

In the autumn of 1966, there was foot-and-mouth disease, caused by virus type O₁ in Germany near the Dutch border. The reports from Germany were that it attacked cattle primarily and then spread to pigs, but that it did not spread among pigs. Following this information, in areas in the Netherlands along the German frontier where the disease was spreading to a dangerous extent, vaccination of cattle was made compulsory in a zone 4-6 miles wide : there was also movement restrictions and suspension of markets, shows etc. When outbreaks occurred in pigs in Germany near the Dutch border, compulsory vaccination of pigs was carried out in opposing areas with a radius of up to 2 miles from the frontier, and other restrictions as in the above-mentioned cattle, were imposed.

When invasion of virus type O₁ became a threat, a start was made with the production of vaccine against it.

Foot-and-mouth disease occurred in the province of Overijssel in November and December 1966. In addition to the usual police measures, the obstruction of pigs and susceptible cattle on the affected farms, and movement restrictions, rapid compulsory ring vaccination was carried out. It appeared that these measures were preventing spread of the infection but different parts of the province became affected by the end of the year. There were considerable distances between some of the outbreaks. Ring vaccination in the province was extended and by early January compulsory vaccination of all pigs in the province over 2 weeks old was introduced: within a week, 600,000 pigs were vaccinated. Vaccine had to be imported. The annual vaccination of cattle was advanced to the end of December and the O vaccine was composed of half O₁ and half O₂.

Barrier vaccination of pigs along parts of the frontier with Germany was carried out when the threat from Germany increased.

In all, 1,500,000 pigs have been vaccinated. Up to early March 12,984 pigs and 471 cattle were destroyed and 2,500,000 guilders paid in compensation for them.

It has not been possible to draw definite conclusions on the value of the present method of combating foot-and-mouth disease in pigs. The impression is that ring vaccination with concentrated vaccine is effective, extension of the disease within the rings occurring only during the first few days after the vaccination.

Different from the type C infection last year, cases of the disease occurred at a longer interval after vaccination when vaccines for cattle were used in 2 doses. In the province of Overijssel, for example, some farms were found to be infected at 15-21 days and some of the animals had been vaccinated twice. These late infections occurred in both sows and other pigs. It would seem that immunisation against virus type O₁ is not so easily accomplished or effective as it is against type C. This is shown by both field and laboratory observations.

The total expenditure amounted to 2,500,000 guilders for compensation and 3,500,000 guilders for vaccinations.

Belgium

The epizootic caused by virus type C in pigs which started on 20 November 1965 ended on 8 April 1966. This was reported in part at the last Session.

The country had been free from the disease from 31 January 1967 until 6 March when 19 new outbreaks due to type O₁ were reported.

The control measures which have been in force for the past few years are maintained, i.e. annual trivalent vaccination of all the cattle stock, complete destruction of all affected and in-contact animals, thorough disinfection in outbreaks and the immediate application of strict sanitary measures.

Federal Republic of Germany

According to information received from the Directorate of the Federal Veterinary Services, it appears that the situation in Germany has considerably improved after a flare-up of the disease in autumn 1966. During the first two months of 1967, the disease gradually disappeared from the south of the country and only three Länder, Nordrhein-Westfalen, Niedersachsen and Schleswig-Holstein are now affected with the disease; however the number of new outbreaks is relatively high. All the present outbreaks are caused by virus type O. By decree of 12 December 1966, annual trivalent vaccination of all cattle over six weeks of age was made compulsory all over the country. The new regulation foresees the use of inactivated vaccines with or without saponin, produced with either natural virus or with virus cultivated according to the Frenkel method, or with virus grown on kidney tissue culture or BHK cells. The vaccine produced has to be subjected to official testing for purity, innocuity and potency before being released; exceptions can only be admitted in emergency situations.

It was emphasized that the persistence of the disease in the Federal Republic of Germany gives rise to much concern not only to the neighbouring countries but to the whole European region.

Eastern Germany

Since 1 May 1966 no outbreaks of the disease have officially been reported.

Poland

Only three outbreaks were officially reported by Poland. Because of the danger of the introduction of virus of an A subtype from eastern Europe, it is understood that Poland imported supplies of homologous vaccine for use in the protection of the most exposed areas of her eastern frontiers.

Czechoslovakia

Four outbreaks were recorded during 1966, i.e. 2 in March and further 2 in May. No outbreaks have been reported in the early months of 1967.

Hungary

It is understood that there has been considerable improvement in the foot-and-mouth disease position in Hungary during the past year.

Austria

As pointed out in the report to the Thirteenth Session of the Commission, foot-and-mouth disease was introduced into Austria in September 1965. From that time on, the disease was prevalent in Austria almost continuously until May 1966. During that period, there were 52 outbreaks, three of which were primary outbreaks, and occurred near the Hungarian, Swiss and German borders respectively. Virus type O was responsible for all the outbreaks.

As in former epizootics, the following measures for eradication were applied with success:-

- a) Severe veterinary police measures;
- b) slaughter of all infected and contact animals;
- c) ring vaccination around the outbreaks. Vaccination on a voluntary basis is only carried out in exceptional cases.

Vaccine prepared from the standard strains at the Austrian Foot-and-Mouth Disease Institute, Vienna, proved effective in the control of the epizootic.

Exact data about the measures taken to eradicate the disease are given in the questionnaire, which was distributed by the Commission in February 1966.

Since May 1966, Austria has again been free from foot-and-mouth disease. After the disease was eradicated, official vaccination was ordered only in the following two cases:-

- 1) Ring vaccination in an area with a radius of 15 kilometres around the Federal Institute for the Control of Animal Virus Diseases in Vienna.
- 2) Vaccination of all ruminants which are to be taken to mountain pastures in Germany and Italy during the summer.

Vaccination of cattle for export is permitted in so far as is required by the importing country.

Switzerland

At the last Session an account was given of the epizootic which occurred during the winter 1965-1966. Only sporadic outbreaks appeared in the subsequent months until June when the situation rapidly returned to normal. This favourable position has certainly been the result of the high percentage of Swiss cattle which could be vaccinated twice against foot-and-mouth disease within a relatively short time. In order to exclude the danger of a new flare-up of the epizootic during the grazing season, the vaccination of the animals intended for summer pastures was applied during April and May. Many Cantons availed themselves of this opportunity to vaccinate their cattle a second time, so that two-thirds of the cattle stock was vaccinated twice during a period of 4 to 5 months.

In December 1966, 4 outbreaks of foot-and-mouth disease occurred in several regions of Switzerland, apparently independent from each other. The causal agent was in all cases, however, virus O₁. Since then, Switzerland has been free from the disease.

As a result of this epizootic, it has been decided to make vaccination compulsory, at least for the year 1967. The vaccination campaign will be carried out during the period 15 February - 15 May and expenditure will be borne entirely by the Federal and local administrations.

Losses due to anaphylactic reactions were minimal, but in several regions, allergic reactions were observed in many instances following treatment with penicillin and streptomycin and in a limited number of cases following administration of hormones.

Italy

The sanitary position with regard to foot-and-mouth disease is steadily improving in Italy. In fact, the number of outbreaks recorded during the first two months of 1967 were 116 as compared with 592 and 2,563 outbreaks reported in the corresponding periods in 1966 and 1965.

This remarkable improvement in the situation has certainly to be attributed to the progressive expansion of systematic vaccination programs of the cattle population in Italy. This program started in 1964 with the vaccination of approximately 2,600,000 cattle in 14 provinces of the Po valley and was extended during 1965 to cover 29 provinces of Northern Italy, 4,367,000 doses being used for this purpose.

In 1966, the program was further expanded in that part of the country and vaccination was carried out on 5,000,000 cattle. As in the previous years, the campaign was carried out in late autumn.

During the period covering these three campaigns, the number of outbreaks recorded in the whole of the country dropped from 12,364 in 1964 to 5,842 in 1965 and further to 1,548 in 1966.

During 1966, 255 specimens from different outbreaks were submitted for typing and gave the following results:-

Type A	was found	35 times
" O "	" "	188 times
" C "	" "	32 times

It is the intention of the Italian Ministry of Health to extend compulsory vaccination to the entire country and to this effect, steps have already been taken in order to secure the necessary funds from the Government.

Spain

During 1966, a deterioration of the sanitary position with regard to foot-and-mouth disease was noted in Spain : 29 outbreaks of foot-and-mouth disease were recorded during that year, 27 of which were caused by virus type O (variant O₆₄ Spain and one by virus C; the type of one outbreak could not be identified).

Seven provinces were affected by the disease and susceptible species were involved. The infection affected mostly swine, followed by sheep, cattle and goats.

In accordance with the existing agreements with neighbouring countries vaccination was carried out in the border areas along the Pyrenees in the early spring of 1966.

Ring vaccination was carried out around the infected areas and 876,000 doses were used to this effect. Voluntary vaccination was extensively carried out in other exposed areas and 728,460 cattle, 1,209,804 small ruminants and 74,333 pigs were subjected to either bivalent or monovalent vaccination. Vaccine was produced partly according to the classical Waldman technique (approximately 670,000 doses) and partly by the Frenkel method (approximately 1,370,000 doses).

During the first two months of 1967, 62 outbreaks were reported in 9 provinces. Three of these were caused by virus C and occurred in the three different provinces, and all the others which were caused by virus type O were distributed among the provinces of Gerona, Huesca, Lérida, Navarra, Asturias and Zamara.

This flare-up of the disease was a matter of real concern to the Spanish authorities, and gave rise to the proposal of a program of compulsory vaccination which would be extended to the major part of the susceptible livestock in the country. This would imply the expenditure of 60.000.000 pesetas. In the hope that this plan will be implemented, in the meantime, the classical control measures have been strengthened, and voluntary vaccination has been encouraged to such an extent that all animals of the threatened areas have practically been subjected to vaccination.

Portugal

Reduction in the intensity of the epizootic which began in May 1965 increased progressively and, during the first eleven months of 1966, there were only 5 small cattle establishments infected and the disease was extremely mild (1 in January, 2 in July and 2 in August).

After a quiet period of 4 months, the disease reappeared in December in 12 establishments in the north of the country and it looked as if a new epizootic was beginning in 1967. In January the disease spread in

the centre and the south of the country and there were new outbreaks in February. Cattle were mostly affected but some pigs also suffered from the disease. At the beginning of March 89 establishments with 514 cattle and 92 pigs were affected. Although the disease showed the usual mild form, 9 districts of the 18 in the country had the disease. Virus type C was identified by the Pirbright Laboratory, for the first time in Portugal. Type O virus was identified on 9 March in an outbreak in cattle on a farm near the southern frontier. There is no slaughter policy in Portugal and only a small amount of vaccination is carried out. At present, bivalent O/C vaccine and trivalent O/A/C vaccine imported from the Netherlands and France is being used. This year, 550 litres have been used. Sanitary police measures are mainly applied.

Malta

It is understood that there has been no foot-and-mouth disease in Malta for many years.

Cyprus

Cyprus is reported as having been free from foot-and-mouth disease for the past 3 years, during which annual vaccination against the disease has been carried out. It will be remembered that Cyprus participated in the SAT1 campaigns in 1962 and 1963, and it is indeed pleasing to know that vaccination campaigns, supported entirely by the country, have been continued against both SAT1 and A22 types of virus.

Albania

For the first time, Austria has received information concerning foot-and-mouth disease in Albania; it covered the period 1.1.1965 - 31.7.1966. According to this information, there was no foot-and-mouth disease in Albania during that period. Unfortunately, no more recent information has been received.

Yugoslavia

During the first six months of 1966, foot-and-mouth disease occurred in cattle and pigs on 12 farms in Yugoslavia. Virus type O was identified in all outbreaks. Strict sanitary measures and the stamping-out method were applied to eradicate the disease. The last outbreak occurred on 21 June 1966 and since then, Yugoslavia has been free from the disease

Romania

As shown at the Thirteenth Session, the policy adopted in Romania in the fight against foot-and-mouth disease is based upon very severe application of general prophylactic measures, the partial zonal preventive vaccination of cattle and sheep along the threatened frontiers and around threatened centres, and stamping out diseased and contact animals in the primary outbreak, completed by ring vaccination.

During 1966 and in the first ten weeks of this year, as mentioned in the monthly reports of the O.I.E., there was a foot-and-mouth disease outbreak in cattle on 18 January 1966 in the village of Chiroiu, 30 km. North-East of Bucharest. The virus type was the same as in the 1965 outbreaks, namely type O, subtype O₁.

By slaughtering the diseased and suspected animals and by vaccination

around this primary outbreak, whose origin could not be clearly traced, full control was established.

During spring 1966, re-vaccination of animals in the buffer zone at the western frontier was carried out with monovalent type O₁ vaccine, produced in Romania.

Special attention was paid in 1966 by the Veterinary Services to the defence of the eastern border, in whose neighbourhood, a type A₁ epizootic was in full swing. According to the (bilateral) veterinary agreement between USSR and Romania, Romania was warned in due time of its spreading in the proximity of the Romanian frontier. Considering the immediate danger of its crossing the border river, on request, the Soviet specialists provided Romania with the responsible strain, A₁. Considering the adequate building and outfits in the Pasteur Institute of Bucharest, O.I.E. was consulted about the preparation of the vaccine with the strain kindly offered by the Soviet Colleagues.

When this was granted, monovalent A₁ vaccine was prepared and used to create a buffer zone of A₁ vaccinated animals along the Eastern frontiers of Romania.

Bulgaria

In Bulgaria a very favourable situation was maintained during 1966 and the first weeks of 1967.

There was only one outbreak in June 1966, which occurred just a few kilometres from the buffer zone, at a time, when in the same buffer zone on Greek territory virus A₂₂ was isolated.

This was a matter of much concern for the Bulgarian authorities, but eventually any relationship between the Bulgarian outbreak and an exotic virus could be excluded.

In fact export animals had been vaccinated against A type, variant A₇, with vaccine produced at Sofia, but unfortunately complete inactivation had not been accomplished.

The disease was eradicated and there have been no further outbreaks.

Greece

Since the last Session there have been two outbreaks of foot-and-mouth disease in pigs in Greece, one caused by virus type A₂₂ in June 1966 in Evros and the other, in March 1967 near Athens, caused by virus type O. The country was free during the interval.

The first outbreak was in the town of Didymotichon, a few hundred metres from the Greco-Turkish border, in a piggery where 55 of the 93 pigs were affected. Virus A₂₂ was identified at the World Reference Laboratory, Pirbright: it was the same type found infecting cattle in the same frontier region in June 1965. The animals in the region had been vaccinated against types A₂₂, SAT1 and O two months earlier during the 1966 spring campaign (buffer zone vaccination). All the affected and contact pigs were destroyed and strict police sanitary measures were applied. There were no further cases in Evros.

The second outbreak, which was also in pigs was in the commune

of Spata, about 20 kilometres from Athens. Type O virus was identified at the Greek Foot-and-Mouth Disease Institute. All the affected and contact pigs were slaughtered and the carcasses were buried and strict sanitary police measures were applied. All susceptible animals throughout the region of Attica were vaccinated with type O vaccine prepared at the Greek Institute.

The pigs had been fed with kitchen scraps from military units and it is suspected that the infection was probably contained in frozen meat imported from South America.

Turkey

In 1966, a total of 819 outbreaks of foot-and-mouth disease was reported in Turkey, with a mortality of 0.03% and a morbidity of 22.4% among the 1,378,127 exposed cloven-footed animals in the affected areas. Compared with 1965, there was a 79.3% decrease in the number of outbreaks. Spread of the disease was prevented by early application of strict sanitary measures and ring vaccination around outbreaks. Viruses type O and A₂₂ caused the outbreaks, type O being the more prevalent. Out of a total of 955 specimens sent to the Etlik Institute, 153 were identified as type A₂₂ and 586 as type O, no virus being demonstrated in the others. There was good correspondence of results whenever typing was made in parallel with the World Reference Laboratory, Pirbright. In specimens from 487 outbreaks in the affected areas, 393 (80.6%) were identified as type O and 94 (19.4%) as type A₂₂.

Virus type A₂₂ which showed a tendency to spread in 1965 caused only sporadic cases in 1966: its occurrence decreased from the end of July and the last time it was found in the middle Anatolian region was September 1966. No cases affected with virus A₂₂ have been found in the buffer zone (Thrace) since November 1965.

The position in the Thrace area is that no virus SAT1 has been demonstrated since October 1963. Virus type O caused 22 outbreaks in different places, some considerable distances from the Bulgarian and Greek borders (11 in Istanbul, 3 in Kirklareli, 8 in Tekirdağ). There was no foot-and-mouth disease in Edirne (the most important province in the buffer zone) during 1966. Concerning virus type O, the latest information is, that there were three outbreaks in Thrace during January and February 1967, each on a single premises (Istanbul, Tekirdağ and Edirne Province), and all at a considerable distance from the border. There was no spread from any of them.

In Anatolia, 797 outbreaks were reported in 1966, all being extinguished. There have been no outbreaks caused by viruses SAT1 and A₂₂ in Anatolia since June 1965 and September 1966 respectively. There has, however, been an increase in outbreaks caused by virus type O since May 1966. Type O was reported in 46 villages in January 1967 and in 25 villages in February 1967. At the present time there are 55 villages in Anatolia under quarantine because of foot-and-mouth disease.

U.S.S.R.

The evolution of foot-and-mouth disease in 1966 is described in the O.I.E. Monthly Epizootic Circular, in accordance with the bimonthly Bulletins regularly sent to the O.I.E. Central Bureau by the Directorate of Veterinary Services of the U.S.S.R., Ministry of Agriculture, Moscow.

The average number of outbreaks in both the European and the Asiatic parts of the U.S.S.R. varied during 1966 between a minimum of 156 and a maximum of 442.

After the epizootic in October, November and December 1965 and January, February and March 1966, the number of outbreaks definitely fell in the summer and autumn of 1966.

In O.I.E. Epizootic Circular No. 242 distributed on 27 February 1967, the following information, taken from the U.S.S.R. Sanitary Bulletin, December 1966, is included:-

3	outbreaks in	Byelorussia
8	"	" Ukraine
3	"	" Georgia
33	"	" Uzbekistan
28	"	" Kazakhstan
15	"	" Kirghizstan
21	"	" Tadhikstan
13	"	" Turkmenistan

The types of virus identified by the U.S.S.R. Veterinary Services were :- A₁ in Russia (Centre, North Caucasus, Volga, Ural and Ukraine); O in North Caucasus, Volga and Ural and Georgia; A₇ and O in East and West Siberia, Uzbekistan, Kazakhstan, Kirghizstan and Turkmenistan.

There is close contact between the laboratory specialists of the U.S.S.R. Ministry of Agriculture and those of the eastern countries with common frontiers with the U.S.S.R., the Razi Institute, Iran and the World Reference Laboratory, Pirbright, with a view to obtaining better information on the behaviour of strains of the virus isolated in the Near-East.

Research work by Iranian, French and Soviet workers concerns the study of the immunological properties of these different strains and the production of specific vaccines.

The U.S.S.R. Veterinary Services have undertaken systematic and energetic control of foot-and-mouth disease in the European part of the territory by the application of quarantine, very severe sanitary police measures and vaccination.

Development of this control has prevented the spread of foot-and-mouth disease caused by virus A₁ towards Central Europe. Still, great vigilance is required by all the Veterinary Services concerned in the countries in the continent of Europe.

Types and Strains of the Virus

Dr. J. Brooksby (United Kingdom) said that there was not much more information on type O virus since work on the differentiation on strains O₁ and O₂ was carried out in 1965 at Pirbright. Strain O₁ seems to be the prevalent type in Europe at the present time. Type C seems to have largely disappeared. The Pirbright Laboratory had already reported slight antigenic differences in strains of A virus from the Near East. They can be divided into (1) strains from Iran; (2) strains from Turkey, Syria and Iraq; (3) the U.S.S.R. strain. The differences are border line and are such that division of the strains into sub-types is not merited. All

are classified at the present time as strain A₂₂. They differ from the earlier A strains.

He spoke of the need to have more specimens examined in order to keep pace with the changes taking place in types of the virus and to prevent confusion arising. European countries can get more service from the World Reference Laboratory by sending more specimens.

Dr. J.G. van Bakkum (Netherlands) spoke of the difference between strain O (Lausanne) and the O strain previously used in vaccine production in the Netherlands. The O (Lausanne) strain, which is still active in the Netherlands, is now incorporated in the vaccine. There has been no type A virus causing outbreaks in the Netherlands for several years. The type C strains in Europe do not show any differences from one another.

Dr. C. Mackowiak (France) found that strains of virus type C, which he had examined since 1960 (the Dutch strain and strains recovered from pigs in France), had shown no serological differences.

He had examined 19 strains of virus type O from Germany and France and found that they were identical serologically and immunologically with virus O (Lausanne).

He referred to virus O which had caused the disease near the Franco-Spanish border and which differed from former type O strains. This strain was now included in the O vaccine in France as well as the O (Flanders) strain and the vaccine gave excellent results both in the field and in laboratory tests.

Strain O (Lausanne) is now used in the vaccine with successful results.

He agreed with Dr. Brooksby in retaining the designation A₂₂ for the group of viruses, the serological and immunological differences of which are very slight. He spoke of some tests in guineapigs carried out in the U.S.S.R. with Near East and U.S.S.R. strains of type A virus, in which some slight differences from a qualitative point of view were shown. It is best to use the strains found in the respective regions for vaccine production. Dr. Nardelli (Italy) said that examinations of 48 strains between January 1966 and February 1967 had shown 41 type O, 3 type A₇ and 4 type C. The O strains were compared, by complement fixation tests and by immunological tests with guineapigs, with strain O (Lausanne) and were found to have similar antigenic structure. Strains O₁ and A₇ are included in the current vaccine.

Dr. N. Muntiu (Romania) made the following statement:

A report was made on the immunological properties of virus strain O₁ at the last Session of the Commission and it was shown that there were significant differences from strain O₂ found in previous outbreaks.

There are now some data on the immunological properties of strain A_i obtained in experimental and laboratory control work on vaccines at the Pasteur Institute, Bucharest.

A study was made to check the antigenic relationship between the exotic A strain and the older A strain used in the Institute as the stock strain for A vaccine preparation. A small batch of vaccine was prepared with each strain of the virus: the Henderson ID50 was used for estimation

of the virus and the vaccines were similarly prepared. The homologous protective dose 50 (PD₅₀) was determined in cattle for each vaccine and cross-immunizations determined the heterologous PD₅₀ in each case. The cross protection ratios were obtained by dividing the homologous PD₅₀ by the heterologous PD₅₀. The product by the two protection ratios, the cross protection product, was 0.029. This implies that the two strains, although of the A type, lie at about the limit where sub-type difference ends and type difference begins. Because of this finding, the use of the stock monovalent A vaccine was given up for zonal prophylactic vaccination. The mutual covering capacity seemed to be low: $\frac{1}{7.5}$ for the stock vaccine strain and $\frac{1}{4.5}$ for the exotic strain.

These findings correspond with those for the type O strains causing the European epizootics in 1959 and 1965: that is that the new strain possesses a higher immunological coverage capacity against the older strain than that of the older strain against the new strain. This could be accounted for by assuming that there has been modification of the antigenic structure of the new strains in order to acquire a wider antigenic spectrum as a condition of survival.

The immunising power of the exotic A strain which was investigated seems of medium value: the average homologous PD₅₀ of 5 batches of vaccine was 0.230 ml, hence the field dose of 2 ml. used in zonal prophylactic vaccinations contained about 8 PD₅₀.

Cattle in Romania appear to be highly susceptible to this new A strain: all the 50 control animals used in the experimental work and vaccine tests showed generalization when challenged with it. Also the cattle of various breeds and ages, following intradermo-lingual injection of the virus, yielded an average of 35 g. vesicular material, which was greater than with strain O₁ of the virus. With the new strain also there is rapid development of both local and generalized lesions: in some animals, foot lesions appeared at 36 hours after they were infected.

The susceptibility of sheep has not been investigated. The conclusions made from the experimental data are:

- (1) European breeds of cattle are susceptible to virus A₁ (A 550/1965);
- (2) this strain has medium antigenicity;
- (3) vaccine prepared with this strain can be used successfully in prophylactic vaccinations.

Dr. J. Fontaine (France) spoke on cross-immunity tests carried out in Teheran with vaccine prepared with virus strains A₅ and A₂₂ when it was found that 20 times more heterologous vaccine was required for protection. There was some evidence that, although there may be some slight differences between the O strains from Turkey and Iran, they are very closely related.

Dr. R. Willems (Belgium) made some general remarks on types of the virus. He spoke of the apparent disappearance of type C from Europe and its replacement by type O in both cattle and pigs. He did not think that variation in type O is a recent occurrence, because in some parts of Europe there had been difficulties with protection using O type vaccine in earlier years, and it had been found necessary to modify the vaccine. He also referred to the variable results obtained with vaccine prepared with different strains of O virus.

In connection with infection occurring in animals following vaccination,

and the view that the vaccine may be responsible, he commented on the stress associated with vaccination which may cause virus already present in the vaccinated animals to become active, recalling the work in the Netherlands and in Great Britain on "carrier" animals.

He spoke of foot-and-mouth disease outbreaks being found at long distances from each other and of exotic virus infections appearing suddenly in a country and the possibility of viruses being wind-borne. There is need for much more study on the epizootiology of foot-and-mouth disease, and for more use to be made by countries of the World Reference Laboratory. He also recalled an O.I.E. Resolution concerning information being given to neighbouring countries when a strain of virus with even minor variations was found.

III. POSITION OF FOOT-AND-MOUTH DISEASE IN THE NEAR-EAST AND NORTHERN AFRICA

The statistical data given in the last table of Appendix 1, prepared by the Secretary, seems to indicate no major recent change in the occurrence of the disease in these regions.

In the Near-East, after two extensive epizootics in 1962 and 1964 caused by virus types SAT1 and A₂₂ respectively, a relatively quiet period has prevailed in the Near-East, virus SAT1 was not recorded in 1966 and virus A₂₂ was found only sporadically. It must be pointed out, however, that it is only in Israel and Iran, that the full facilities exist for systematic investigation of outbreaks : in both countries virus A₂₂ was isolated also in 1966.

Type O was the dominant virus in the region and caused a local epizootic in Iraq.

In northern Africa, the disease occurred sporadically, with virus type O being dominant. This type of the virus seems to have been found again recently in Egypt after a long absence.

Although the statistical data in Appendix 1 only indicate the general position, it is of interest, that up to the present time, northern Africa has been free of both SAT1 and A₂₂ types of the virus.

Research is in progress by Dr. Traub and his co-workers and by the French team at the Razi Institute, Teheran, to evaluate the significance of several strains of virus types A and O which have been occurring in the region since 1963. A summary of an article on serological studies of strains of these viruses by Dr. Traub, NEAHI, Iran and his co-workers to be published is given in Appendix 2.

Dr. F.H. Olvey, Epidemiologist, Near East Animal Health Institute, Beirut, made the following statement:

Type A virus did not play a significant role in the foot-and-mouth disease outbreaks in 1966 in region countries. Following the widespread epizootics of type A foot-and-mouth disease in 1964-1965 a large percentage of animals are undoubtedly immune (from 95% A-immune in limited survey).

Outbreaks occurred in Lebanon, Syria, Jordan, Iraq, Egypt(UAR), the Gulf States and Iran, with heaviest losses reported in small ruminants in Iran. Type O virus was confirmed in most countries submitting

epithelial specimens.

Submission of specimens was very limited, except in those countries having staff and facilities for viral typing. Information as to the introduction and spread of the reported outbreaks of disease is lacking. The prevailing type O virus is enzootic in the region, and reports confirming this virus do not cause great concern.

A large percentage of herds of foreign origin (exotic) received prophylactic vaccination with appropriate vaccine at regular intervals. Indigenous cattle were not acutely affected by the type O virus. Economic losses in these animals were not greater than livestock owners have learned to expect and have accepted for years from this disease.

Limited numbers of cattle and sheep of African origin are being imported by some countries in the region. Facilities to handle these animals with any degree of safety are lacking and a very grave danger of importation of diseased animals exists. Construction of adequate quarantine facilities is under way in several countries. The lack of trained staff to operate these facilities is cause for considerable concern at present.

The Near East Animal Health Institute in its forward planning has made provision for employment of a Veterinary Officer on the Central Office staff to advise and assist region countries on programs involving international shipment of livestock. This technical assistance will be directed to exporting and importing countries and cover country agreements, supervision of movements of animals and holding and quarantine facilities.

Investigation and research in foot-and-mouth disease as reported by Dr. Eric Fraub, is summarized as follows:

In addition to the attenuation of local virus strains by tissue culture passage, serological studies of field strains of foot-and-mouth disease have been continued.

Vaccination of sheep was carried out with the aim to study the antibody response of sheep to one and two vaccinations with formalized adsorbate vaccine prepared from ovine embryo kidney cells (OEK) infected with type O virus. One vaccine was not concentrated, the other concentrated four-fold by removal of 75% of the antigen-free supernatant. Fourteen sheep which carried no antibodies against type O virus were used in the experiment. The mean ND50 of the two groups of sheep after single and double vaccination with non-concentrated and concentrated vaccine, respectively, were compared. The result suggests that, in order to get a high degree of maternal passive immunity in new-born lambs, pregnant ewes should be vaccinated twice, preferably with concentrated vaccine.

Virus was isolated for the first time from one of two live sheep embryos acquired from the Teheran slaughterhouse in September 1966. The virus, type O, was not cytopathogenic in kidney cells from this embryo, but had typical CPE in BHK and other OEK cells.

IV. FAO CAMPAIGNS AGAINST FOOT-AND-MOUTH DISEASE IN SOUTH-EASTERN EUROPE AND ANATOLIA

In introducing this item, the Chairman mentioned some of the points contained in the report composed by the Secretary, which is now Appendix 3 of this Report. He referred to the urgency for action when the SAT1 virus first appeared in the Near-East and invaded Turkey and to the appeal for funds, to start a campaign, launched by the Director-General of FAO.

The contributions received up to the end of 1966, in Tables 1 and 4, show the support given by the provision of both funds and of vaccines to be used in the campaigns. Much assistance was received from the European Economic Community, the contributions being administered separately under a Trust Fund, on the advice of an FAO/EEC/OIE Consultative Committee.

The contribution of 2 US cents suggested in the appeal would probably have been sufficient to finance the campaigns if a second exotic virus (A22) had not invaded the same area and caused a further epizootic.

One of the important parts of the campaigns was the setting up of buffer zones between countries with a view to arresting the extension of the infection. These have proved valuable and their maintenance has shown their effectiveness. In addition, for three years, vaccination of livestock throughout Turkish Thrace has had effective results owing to the efforts made by the Turkish Government. The disease has been further controlled by ring vaccination around outbreaks in Anatolia.

Vaccination programs in 1966

Due to the assistance from Great Britain and the European Economic Community, vaccination could be continued in 1966. It was possible only to carry out bivalent vaccination of the buffer zones and the most exposed provinces of Turkish Thrace. For the first time since the campaigns began, no vaccination campaign was carried out in the buffer zones or in the rest of Thrace during the second half of the year, i.e. there was no autumn vaccination.

The results of the campaigns during the past years are very obvious. The success has been made possible by financial and technical contributions, supplies of vaccine generously donated and by the marked cooperation of countries and organizations.

Greece

The Greek delegation made the following statement:

The measures adopted in Greece against foot-and-mouth disease have been reviewed in former reports. Essentially, they are immediate typing of the causal virus, slaughter of animals in primary outbreaks (stamping out), application of very strict sanitary measures, together with extensive and early ring vaccination in a wide area around the outbreak.

Preventive vaccination of animals, particularly dairy cows, is carried out periodically in some areas and especially around the large cities (Athens, Salonica).

Since the appearance of exotic types of the virus near the Greek frontiers and particularly after these types arrived in their territory (once SAT1 and twice A22), very great attention is given to the Evros frontier zone, the

buffer zone, in which all the animals susceptible to foot-and-mouth disease are vaccinated regularly once or twice a year, against types SAT1, A₂₂ and O. During the campaign in this region (April-May, 1966), the following are the particulars of the vaccinations:

<u>Species of animal</u>	<u>Number vaccinated</u>		
	<u>SAT1</u>	<u>A₂₂</u>	<u>O</u>
Cattle and buffaloes	67,085	70,485	70,485
Small ruminants	180,215	192,056	192,056
Pigs	5,051	6,054	6,054

A₂₂ and O vaccines are given at the same time.

Greece is now preparing for a new campaign in the spring of 1967, comprising vaccination with A₂₂ and O vaccines of all the animals in the Evros region.

Vaccines produced at their own Foot-and-Mouth Disease Institute for the classical types of the virus and vaccines from Pirbright or IFFA for the exotic types will be used. The delegate of Greece thanked the various European countries who have very kindly provided these latter vaccines.

It is particularly because of this international assistance that the country has been able to conduct effective control of foot-and-mouth disease up to the present time, especially against the exotic types of the virus which, in 1962, 1965 and 1966 appeared at the eastern frontiers.

The fact that these types of the virus have not been able to cross the territory and to invade Europe because of the measures taken in this country, stresses the need for international cooperation concerning foot-and mouth disease, an epizootic disease which crosses frontiers.

Bulgaria

The Secretary reported that as in preceding years, Bulgaria has participated in the maintenance of buffer zones in south-eastern Europe.

About 300,000 small ruminants and 50,000 cattle were vaccinated in the spring of 1966 against SAT1 and A₂₂ virus with vaccine supplied by FAO. Vaccination was carried out along the areas bordering Turkey and Greece, up to the frontiers with Yugoslavia.

A rigid control of movements of animals and persons at the frontier points with Turkey and the Greek province of Evros was maintained also last year.

The production of foot-and-mouth disease vaccine, European type, in Bulgaria is carried out on a very limited scale so that part of the vaccine has to be imported.

For this reason, Bulgaria has decided to build a new and modern foot-and mouth disease institute.

With regard to the spring campaign in 1967, Dr. Popov, expressed the gratitude of his Government for the vaccine allocated through FAO (180,000 doses monovalent A₂₂ vaccine). He also mentioned that the necessary amount of O vaccine has been obtained to carry out bivalent vaccination (A₂₂/O) of the buffer zone.

The operations will commence as soon as the A₂₂ vaccine has arrived from Pirbright.

Turkey

The Turkish delegation summarized the action taken to control foot-and mouth disease during 1966: 600,000 cattle doses of bivalent SAT1/A₂₂ vaccine received from FAO were used in Thrace including the Gelibolu peninsula. In addition, 300,000 doses of monovalent O vaccine were received from the Federal Republic of Germany as bilateral assistance. The vaccine produced at Etlik amounted to 500,000 doses. In both the buffer zone and other regions of Anatolia, a total of 2,533,556 head of cloven-hoofed animals throughout Turkey were vaccinated, 1,574,103 being in Thrace.

Following information of the presence of virus type O in the border areas with Iran, Iraq and Syria, preventive vaccination was carried out in the most exposed villages. Priority was given to the vaccination of Government cattle breeding farms, private dairy farms and animals intended for fattening and export.

Considerable emphasis was placed on the control of animal movements both at the borders and within the country. Every effort was made to avoid animals sent from Anatolia to the Istanbul market reaching the buffer zone.

With regard to the program for the 1967 campaign, the Turkish delegation expressed their readiness to make use of the A₂₂ vaccine promised by FAO for the maintenance of the buffer zone in Thrace. A supply of 300,000 doses of O vaccine was also requested in order to ensure bivalent vaccination along the borders with Greece and Bulgaria. Unfortunately, Turkey will not be in a position until May to furnish the necessary O vaccine for this purpose.

In addition to the program in the buffer zones, Turkey proposes also to carry out a vaccination campaign along the eastern and southern borders of the country, in an attempt to prevent further invasion of foot-and-mouth disease from the Near Eastern countries. However, the implementation of such a project would imply considerable assistance from FAO, since the necessary vaccine cannot yet be made available by Turkey itself. It is, therefore, the view of the Turkish delegation that ways and means should be found to ensure the implementation of the resolutions passed by the FAO Regional Conference at Seville. In fact, the benefit of the establishment of buffer zones in southern and eastern Anatolia would be reflected not only in Turkey but also in Europe as a whole. The participation of Iran, Iraq and Syria by similar buffer zones on their frontiers with Turkey would be of the greatest value in completing arrangements for the prevention of foot-and-mouth disease entering Turkey.

The Secretary explained the position of Trust Funds 111 and 97 as at 1 March 1967.

At the end of December 1966 the total amount in the two funds was about US\$ 220,000. Since December, the spring campaign has been arranged and has required the expenditure of US\$ 104,000 for the purchase of 400,000 doses of A₂₂ vaccine. There were also available in Great Britain 690,000 doses of monovalent A₂₂ vaccine for use in this campaign. The Government of France promised to provide 350,000 doses of A₂₂ vaccine as a donation to the campaign. The A₂₂ vaccine, now made available, has been allocated as follows:-

220,000 doses to Greece;
180,000 doses to Bulgaria;
1,040,000 doses to Turkey.

For the purchase of equipment and technical assistance to Turkey, US\$ 40,000 has been committed.

The total sum now available does not exceed about US\$ 75,000.

Future activities and financial requirements

The Chairman drew attention particularly to pages 46 and 47 of (Appendix 3) where the various points for consideration in planning future vaccinations are given and where the FAO Regional Conference for Europe requests the Director-General of FAO to make a study of the possibility of creating a new buffer zone and to suggest possible ways and means of implementing recommendations of such a study.

The FAO/EEC/OIE Consultative Committee stressed the need for mass vaccination against the A₂₂ virus in Thrace during spring 1967 and also the holding of stocks of vaccine for immediate use in Europe against the invasion of any exotic virus.

To meet the costs of extending the buffer zones and the various suggestions, as shown on page 47 of Appendix 3, the total estimated amount would be US\$ 835,500 for 1967.

For continuation of the present campaign in the spring of this year, savings in 1966, in particular by dropping the autumn campaign in Thrace, are available and a generous supply of vaccine to be donated by the French Government has been promised. This will enable vaccination against virus A₂₂ to commence in Thrace very soon. It has not been possible, however, to make provision for supplies of type O vaccine for Turkey, or for any other of the suggestions, including extension of the buffer zone or the holding of stocks of vaccine for emergency use in Europe against possible invasions of exotic viruses: nor is there any provision for the continuation of vaccination campaigns in the future. It has to be pointed out that the suggested new buffer zone is an addition to and not a substitute for the present buffer zone in Thrace, which should be kept for some further years at least.

Discussion of the campaigns

This concerned both the present campaigns and the question of the further campaign in the east of Turkey raised by the Turkish delegation and the subject of the Resolution from the FAO Regional Conference at Seville in October 1966.

The Turkish delegation explained that Turkey was not yet in a position to produce sufficient vaccine for use in the present campaign but anticipate that within 2-3 years their new institute would be in a position to meet the requirements for this campaign.

The continuation of maintaining vaccination in Thrace for some years to come is considered of paramount importance so that the great benefit which has resulted by controlling two major epizootics and freeing Thrace from exotic foot-and-mouth disease virus should not be lost. It has to be

remembered that the major epizootics enter Turkey from the east and, judging by the results of the buffer zone in the west, a similar zone on the eastern frontier of Turkey would do much to prevent such invasions.

The assistance now being requested by Turkey is of a temporary nature until such time that the new institute is in full working order.

Various delegations expressed views on the Turkish request. While most of the discussion on the present vaccination campaigns favoured continuation in the meantime, it was felt that adequate financial assistance may prove somewhat difficult.

On the subject of vaccination campaigns, it was intimated that a meeting of the FAO/LEC/OIE Consultative Committee is to be held in Ankara in April to evaluate the position and to consider further the possibilities of assistance to these campaigns.

It was decided by the Session to await the report of the Ankara meeting before future vaccination campaigns in Turkey should be further considered.

V. REPORT OF THE EXECUTIVE COMMITTEE

This report is given in Appendix 4 of the Report of the Session.

In introducing this item, the Chairman spoke of the work of the Secretary in connection with the campaigns in South-eastern Europe, his visits to various countries, his attendance at conferences and meetings and his collaboration with field and laboratory workers, all resulting in additional information on various aspects of foot-and-mouth disease and its control.

He found it gratifying that there are now new or better facilities for large-scale vaccine production for use against important strains of the virus.

He referred to the plans being worked out by the Turkish Government concerning the construction of new slaughterhouses and the transference of others, all of which will avoid the transportation of live animals over long distances, thus reducing the chances of foot-and-mouth disease being carried from one part of the country to another.

He drew attention to the mission to Bulgaria and Ethiopia to look into the precautions taken to prevent the introduction of foot-and-mouth disease virus with frozen meat imported into Bulgaria from Eritrea.

He drew special attention to the meeting of the Research Group of the Commission's Standing Technical Committee at Pirbright, England, when some important subjects requested by the Commission were dealt with. These included the use of guineapigs instead of cattle in testing the potency of vaccines, vaccination of pigs and vaccination of sheep. He noted the use of BHK₂₁ cells in the cultivation of virus for use in large-scale vaccine production, and remarked specially on the question of virus-carrying cattle as described in the report. The acceptance by the Research Group of the invitation to hold its annual meeting at Plum Island, U.S.A., was of special importance so that there could be an exchange of information on research work with American colleagues and discussions on future research activities. (see Appendix IVa).

The report of the Executive Committee was approved.

VI. BUDGETS AND ACCOUNTS

The budgets and accounts as shown in Appendix 5 and 6 were approved by the Session.

Increase in contributions (see Appendix VII)

The Commission was established 14 years ago and the original scale of contributions to be paid by Member countries is still operative. The costs of administration and of the various essential activities of the Commission continue to increase with the rise in general costs throughout the world. The Commission has the duty of carrying out "Special Functions" in accordance with the provisions in Article V of the Constitution; for this purpose the Special Account was instituted.

Each year any excess of income from contributions of member countries over expenditure is transferred from the General Account to the Special Account. Without an increase in the contributions of member countries the funds in the Special Account will soon be absorbed, and the usefulness of the Commission could be seriously affected.

Discussion of the Executive Committee's view of the need to increase the contributions of member countries by 20 percent showed unanimous agreement by the delegates of 14 countries present at the session.

The Commission made the following recommendation:

The Delegates to the XIVth Session of the European Commission for the Control of Foot-and-Mouth Disease unanimously agreed in principle on the need for an increase of 20 percent in the present scale of contributions established 14 years ago. However, since several delegates had not received instructions from their Governments enabling them to agree formally to such increase, the Commission requested the Director-General to approach Member Governments to seek their concurrence and to communicate to them the scale of contributions reflecting such increase.

VII. ELECTIONS

On the proposal of the Delegation from the Netherlands, seconded by the Delegation from Greece, Dr. Chr. Werdelin (Denmark) was unanimously elected Chairman for the next year by the Commission.

On the proposal of the Delegation from Yugoslavia, seconded by the Delegation from Belgium, Mr. J. Reid (United Kingdom) and Dr. R. Gaier (Austria) were unanimously elected Vice-Chairmen for the next year by the Commission.

On the proposal of the Delegation from the United Kingdom, seconded by the Delegation from Turkey, Dr. J.M. van den Born (Netherlands), Dr. J. Perakakis (Greece) and Dr. A. Nabholz (Switzerland) were unanimously elected members of the Executive Committee by the Commission.

VIII. ADOPTION OF THE REPORT OF THE SESSION

The Draft Report of the XIVth Session, as presented, was approved, subject to the amendments made at the meeting and to any necessary editorial change.

IX. ANY OTHER BUSINESS

The Chairman suggested that the meeting of the XVth Session could conveniently be held in Rome on 27-29 March 1968. This was agreed.

Dr. Vollan (Norway) expressed the views of the delegates in congratulating Dr. Gaier on the excellent work he had done during the two years as Chairman of the Commission.

Dr. Gaier (Austria) thanked all concerned for their support during the past two years and closed the meeting.

THE POSITION OF FOOT-AND-MOUTH DISEASE IN EUROPE
SINCE THE LAST SESSION

Introduction

In 1966, the pattern of foot-and-mouth disease in Europe showed much the same characteristics as in the preceding years. After periods of recrudescence during the winter there followed a marked decrease in the incidence or even disappearance of the disease almost throughout the Continent.

The progress in the systematic control of the disease is slow but continuous; this is evidenced by the gradual restriction of the zones which are ordinarily affected by the disease, and the gradual reduction of the number of outbreaks in the individual affected countries; and this, despite the spread of a new strain of virus O (O Lausanne) which appeared in October 1965, and the difficulties encountered in adapting the vaccines to the new situation.

In spring 1966, the local epizootics which flared up in the preceding autumn in Belgium and the Netherlands following the spread of the C virus in swine, and in Switzerland the Lausanne strain, variant of the O type virus, had regressed. Also Austria, Denmark and France regained freedom from the disease at the same time.

Summer was characterized by a favourable situation in almost all countries comprising those usually affected by local epizootics. Amongst those, Italy and Germany experienced a substantial improvement; in Germany, however, the situation again deteriorated as from October, when virus type O gave rise to a new winter epizootic in Lower Saxony and the Rhineland.

At the end of the year, after an unusually favourable autumn all over Western Europe (with exception of Germany), numerous outbreaks appeared almost simultaneously in various European countries; in the first weeks of 1967 the phenomenon became more accentuated with cases of disease reported also from the Iberian peninsula and from the United Kingdom.

Since autumn 1966, virus type O, (O₁), probably the same strain which caused the epizootic in Switzerland the year before, has been dominant in western Europe.

The eastern regions of the Continent remained under the threat of the A22 virus which has not ceased to occur, though sporadically, in several western republics of the Soviet Union. The pressure of exotic FMD has lessened, however, in south-eastern Europe, in Turkish Thrace in particular.

It seems worthwhile to mention that all over Turkey the SAT1 virus has not been in evidence since June 1965, and that even the A22 virus has not been isolated in Thrace since October 1966. O virus has regained impetus, however.

The systematic and more extended vaccination of the cattle population over large European territories has allowed for maintenance or consolidation of the good results obtained in the control of the disease during past years. The progress reached in the quality and production capacity of vaccines is largely responsible for the success obtained in countries, either by keeping the disease outside their borders or rapidly restoring the situation.

Table I shows the outbreaks and virus types recorded in Europe, the Near East and Northern Africa in 1966.



TABLE I

Outbreaks of foot-and-mouth disease and virus types recorded in Europe, the Near East and Northern Africa during 1966

EUROPE	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Iceland, Ireland, Norway, Finland	-	-	-	-	-	-	-	-	-	-	-	-
Sweden	-	-	1 0	-	-	-	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-	14 0	15 0	4 0 A*	1 A*	-	-
Denmark	-	8 0	11 0	7 0	13 0	-	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	190 C	119 C	8 C	6 C	-	-	-	-	-	-	-	-
Netherlands	1611 C	347 C	97 C	128 C	3 C	-	-	-	-	-	1 0	7 0
France	15 C	4 C	1 C	-	-	-	1	-	-	-	16 0	22 0
Federal Republic of Germany	1205 O A C	576 O A C	537 O A C	385 O A C	158 O A C	52 O A C	23 O A C	19 O A C	97 O A	323 0	583 O A C	731 O A
Eastern Germany	6 O C	7 C	1 C	15 O	-	-	-	-	-	-	-	-
Poland	-	-	1 A	-	-	-	1 0	-	-	-	-	1 0

Notes: A dash indicates no outbreak; a blank indicates no information received.

A* indicates subtype A22 or A1

Types: Federal Republic of Germany: Virus type C was dominant in the first six months (among swine); type O was dominant in the second half of 1966 and type A occurred sporadically.

Europe continued	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Czechoslovakia	-	-	2	-	2	-	-	-	-	-	-	-
Hungary	-	-	2	-	-	-	-	-	-	-	-	-
Austria	18	2	1	-	1	-	-	-	-	-	-	-
Switzerland	255	40	9	6	6	1	-	-	-	-	-	4
Italy	366	226	167	77	130	206	151	85	50	35	33	33
Spain**	7	2	2	-	3	1	-	-	-	-	2	12
Portugal	1	-	-	-	-	-	2	2	-	-	-	12
Malta and Cyprus	-	-	-	-	-	-	-	-	-	-	-	-
Albania	-	-	-	-	-	-	-	-	-	-	-	-
Yugoslavia	-	-	-	-	3	9	-	-	-	-	-	-
Greece	-	-	-	-	-	1	-	-	-	-	-	-
Bulgaria**	-	-	-	-	-	1	-	-	-	-	-	-
Romania	1	-	-	-	-	-	-	-	-	-	-	-
Turkey**	34	29	18	41	87	157	131	39	49	65	80	86
U.S.S.R. (including Asiatic Republics)	442	329	352	151	206	197	189	185	197	271	258	236

Notes: Switzerland: type O, sub-type "O Lausanne" dominant; Italy: O type dominant; Turkey: O type dominant, no outbreak of A* virus was recorded in Thrace during 1966; ** The data refer to municipalities or villages and not to single outbreaks. U.S.S.R. Types and sub-types recorded: O, A7, A20, A1 (A22)

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
NEAR EAST												
Syria	2	3	2	-	6	9	7	3	-	5	8	15
Jordan	2	1	-	-	1	1	4	1	-	1	3	
Lebanon	9	18	58	12	19	15	19	2	-	3	4	9
Irak (cases)	-	-	-		25			277	7687	1309	32919	2353
Iran	11	22	65	171	-	-	336	154	40	33	11	
Kuwait, Bahrein	-	-	-	1	1	1						
Israel	-	-	1	1	1	1	-	-	1	-	-	-
			A*	A*	A*	A*			A*			
NORTHERN AFRICA												
U.A.R.	-	-	1	-	-	-	-	-	-	-	-	-
Libya												
Tunisia	-	-										
Algeria	3	4	10	14	24	1	1					
Morocco	-	-	-	-	-	-	-	-	-	-	-	-

Notes: Virus types recorded: type O (dominant), type A and subtype A₂₂ in the Near East
type O (dominant) and type C in Northern Africa

APPENDIX II

SEROLOGICAL VARIATION OF FOOT-AND-MOUTH DISEASE VIRUS
IN IRAN (1963-1966)

A paper with the above title will be published soon by Dr. E. Traub and his co-workers at the Near East Animal Health Institute, Razi Serum and Vaccine Institute, Teheran. Dr. Traub has kindly provided us with a copy of the paper, of which the following is a brief summary, for information.

During the period November 1963 to May 1966, examinations were carried out on 8 strains of virus type A and 9 strains of virus type O, all isolated from infected native or foreign cattle in Iran: strain type A "Turkey" received from Turkey and stated in the paper as being probably identical with "Near East A" was also included.

Complement fixation tests and neutralization tests were carried out. Immune sera for some of the strains were prepared in guineapigs. For CF tests, the method described by Traub and Möhlmann in 1943, with some minor modifications was used. In most of the CF tests tissue culture antigens, consisting of the fluid from first or second passages of the field strains in baby hamster kidney cells (BHK cell line) were used and the sera were in two-fold dilutions. The titres shown in Table I represent the highest serum dilutions giving complete fixation.

The neutralization tests were made mostly in monolayer cultures of calf kidney cells and, occasionally, in ovine embryo kidney cells. Constant amounts of virus from first passages of the strains in calf kidney cells were used with equal parts of diluted or undiluted immune serum. The ND₅₀ of immune sera in the presence of different virus strains were calculated according to the method of Reed and Muench. Cross-immunity tests were not carried out in animals.

The results of the work with type A strains (Table I) show that a new type A variant (strains A "Khordan" and A "Shemiran") appeared in the Teheran area in 1964, which was different by both CF and neutralization tests from the previously prevalent type A "Teheran": it is, however, closely related to, or identical with, strain A "Turkey". Investigations are still in progress with strain A "Hyderabad" which was recovered some 45 Km. west of Teheran to determine whether it represents a true variant or a mixture of two strains. In discussing this finding it is

stated that "the early appearance in Iran of a variant strain serologically identical with A "Turkey" leaves the possibility open that the virus recently designated as "Near East A", the connective agent of an epizootic of large proportions involving numerous countries, either originated in Iran or spread to neighbouring countries via Iran".

With regard to type O strains (Table II), those isolated between December 1963 and October 1964 showed no indication of serological variation: on the other hand, the O strains isolated in December 1965 and in February 1966 were found to differ in CF tests slightly from strain O "Rey" No. 4, isolated in December 1963, with which immune serum was prepared. There are also differences in the strains shown from the results of the neutralization tests.

The paper gives an account also of the use of overnight fixation in the cold instead of incubation at 37°C for 30 minutes, in carrying out CF tests. Overnight fixation was found to be useful for demonstrating small amounts of antibody or antigen which would not be detected by the shorter technique. It may also demonstrate a common antigen shared by different types of the virus, when the shorter technique fails to do so. It is stated, however, that in general, short fixation is preferable for the study and classification of variants or sub-types because it brings out strain differences more clearly.

Reference in the paper is made to the recent statements that cross-neutralization tests give a clearer picture of antigenic character of variants of foot-and-mouth disease virus than do crosswise tests. This is not supported by the results shown in the tables reproduced in this summary, taken from the original paper: the data confirms the findings of Galloway, Henderson and Brooksby published in 1948, that there is good agreement between the results of CF and neutralization tests in variant detection.

In discussing the importance of serological variants or subtypes for vaccination, it is concluded that the safest procedure for vaccine manufacture is to use as the production strain the virus actually present in the field at a given time. This conclusion is reached from a review of published articles, particular note being made of the publication by Hyslop, Davie and Carter in 1963 on comparisons of different variant strains of SAT₁ by CF and neutralization tests and by quantitative vaccination experiments in large numbers of cattle, the results being in good agreement and showing the significance of serological strain differences for vaccination.

Table I
Complement-fixation and neutralization tests with A strains
isolated 1963 - 1965

Antigen of strain	Serum	CF test with TC antigen		Neutralization tests	
		4+ titer*	Mean fixation** (per cent)	ND50	Mean CPE (per cent)
A "Teheran" isolated Nov. 1963	A "Teheran"	1:160	83	1:6.7	8
	A "Tabriz"	1:40	56	1:2.1	13
	A "Turkey"	1:40	65	1:1.7	28
	normal g.pig	-	0	-	75
A "Hyderabad" Feb. 1964	A "Teheran"	1:80	67	1:39.9	3
	A "Tabriz"	1:20	40	1:1.2	28
	A "Turkey"	1:80	81	1:45.2	1
	normal g.pig	-	0	-	75
A "Khordan" May 1964	A "Teheran"	1:5	19	1:3.6	38
	A "Tabriz"	1:40	62	1:5.8	17
	A "Turkey"	1:160	85	1:24.0	2
	normal g.pig	-	0	-	87
A "Shemiran" May 1964	A "Teheran"	1:10	23	1:3.0	12
	A "Tabriz"	1:40	56	1:25.4	4
	A "Turkey"	1:160	83	1:45.2	1
	normal g.pig	-	0	-	40
A "Razi" June 1964	A "Teheran"	1:5	17	1:2.5	35
	A "Tabriz"	1:40	62	1:13.7	3
	A "Turkey"	1:80	69	1:11.5	10
	normal g.pig	-	0	-	67
A "Hamadan" June 1964	A "Teheran"	1:20	40	1:2.2	22
	A "Tabriz"	1:80	71	1:8.0	11
	A "Turkey"	1:80	75	1:5.6	14
	normal g.pig	-	0	-	62
A "Tabriz" Dec. 1964	A "Teheran"	1:20	40	1:2.4	30
	A "Tabriz"	1:80	81	1:14.2	12
	A "Turkey"	1:80	73	1:5.3	20
	normal g.pig	-	0	-	64
A "Turkey" Jan. 1965	A "Teheran"	1:5	17	1:1.2	30
	A "Tabriz"	1:40	52	1:5.6	8
	A "Turkey"	1:160	83	1:22.1	1
	normal g.pig	-	0	-	50

* highest serum dilution giving 100 per cent fixation with undiluted antigen.

** mean fixation by serum diluted 1:10 to 1:320 in the presence of undiluted antigen.

Table II
Complement-fixation and neutralization tests with
O strains

Test No.	Antigen of strain	Serum	CF Tests with TC antigen		Neutralization tests	
			4+ titer of serum	Mean fixation (per cent)	ND ₅₀	Mean CPE (per cent)
1	O"Rey" No. 4 Dec. 1963	O"Rey" No. 4	1:80	67	1:71.1	6 (60)*
	O"Rey" No. 4 March 1964	dtto.	1:80	73	1:50.8	5 (60)*
	O"Shiraz" June 1964	dtto.	1:80	73	1:128	0.2 (48)*
	O"Meshed" Oct. 1964	dtto.	1:80	73	1:128 <	0 (43)*
2	O"Sepahpoor" Dec. 1965	O"Rey" No. 4	1:120	45	1:3.0	16
		O"Sepahpoor"	1:40	64	1:4.8	10
		Normal g.pig	-	0	-	44
	O"Karadj" Feb. 1966	O"Rey" No. 4	1:20	45	1:2.8	17
		O"Sepahpoor"	1:40	62	1:6.2	13
		Normal g.pig	-	0	-	42
	O"Rey" No. 4	O"Rey" No. 4	1:40	60	1:5.3	45
		O"Sepahpoor"	1:40	59	1:1.3	55
		Normal g.pig	-	0	-	100

* mean CPE in control cultures containing normal serum

APPENDIX III

FAO CAMPAIGNS AGAINST FOOT-AND-MOUTH DISEASE IN SOUTH EASTERN
EUROPE AND ANATOLIA

Review of the Activities and Situation
as at 31 December 1966

Introduction

A new epizootic caused by SAT1 virus, an African type of foot-and-mouth disease virus, appeared in January 1962 in the Persian Gulf and spread towards the north west involving, in a few months, all the countries of the Near East and both the Asiatic and the European parts of Turkey. In Turkey alone, the estimated losses due to foot-and-mouth disease during 1962 and 1963 amounted to approximately US\$30,000,000 and 56,000,000 respectively.

These facts support the view that an invasion of Europe by the SAT1 virus would have had an effect on the European livestock population similar to the disaster caused by the foot-and-mouth disease epizootic in 1951-1952. Losses of around US\$600,000,000 were experienced on that occasion: the agent was the A5 (A7) variant of the foot-and-mouth disease virus.

First initiatives for the control of the new epizootic

An emergency meeting of the Executive Committee of the European Commission was convened in London on 7 May 1963 during which the situation caused by the appearance of the SAT1 virus in the Near East was reviewed.

A joint FAO/OIE meeting was called at Teheran on 16-18 June 1962 in an attempt to find out ways and means for controlling the disease in the countries already invaded (in the south of Turkey and south-west of Iran).

During the same month a mission sent by FAO to Turkey, assisted by Turkish Officers, to survey the situation, isolated the SAT1 virus in the proximity of the borders of the Syrian Arab Republic.

An emergency meeting of the European Commission for the Control of Foot-and-Mouth Disease was called on 20-21 July in Rome; the results of the mission to Turkey were discussed and the situation in the infected countries was again evaluated. The Commission recognized the need for urgent action to control the further spread of the disease and recommended that the Director-General of FAO should "endeavour to procure funds to finance the operations of the campaign against the disease from the sources already available or by any means open to him".

Soon afterwards a fund-raising campaign was launched (July 1962) by the Director-General among European countries. The purposes of the campaign were first of all to arrest the advance of the disease into the European continent by the creation and maintenance of buffer zones of immunized animals and, secondly, to support the assisted countries in their efforts to control foot-and-mouth disease in south-eastern Europe, in Anatolia and possibly in other areas of the Near East region.

A special conference was called by OIE on 1-2 October of the same year (1962) in Vienna. All European countries were warned against the danger of the exotic virus moving into Europe, a system of sanitary and prophylactic measures was recommended and in particular international collaboration was encouraged. The decisions taken at the above-mentioned meetings at Teheran and Rome were approved.

Participation of countries and administration of the campaign

The response to the FAO appeal for a campaign against the exotic SAT1 virus began to materialize in September 1962 when Ireland and Switzerland deposited their contributions with FAO and the United Kingdom donated, before making a contribution, the entire stock of inactivated SAT1 vaccine held in reserve at the Pirbright Institute for Europe. Since then, Austria, Yugoslavia, Israel, Finland, Ireland, Sweden, Denmark and Norway joined individually in the effort, while the countries of the European Economic Community decided to deposit their contributions collectively with the Organization. FAO itself, the European Commission for the Control of Foot-and-Mouth Disease and the UN Contingency Fund have also participated in this financial effort.

The global contribution so far received by FAO amounts to US\$4,513,171 which does not include bilateral aid, consisting mainly in the allocation of vaccines obtained directly by the assisted countries from different sources in Europe.

In accordance with a desire expressed by the EEC in May 1963, the contribution of the European Community has been administered separately under Trust Fund 111 and, for this purpose, the advice of an "ad hoc" Consultative Committee was sought. An agreement was reached between EEC and FAO that the Consultative Committee should also include a representative of OIE and a representative of all the individually contributing European countries, not members of the European Economic Community.

The FAO/EEC/OIE Consultative Committee has met once a year and its advice has served as guidance for the campaign.

The list of contributions received for the campaign is shown in Table I.

Organization of the Campaigns and Evolution of the Disease Situation

The first action in 1962 was aimed at blocking the disease in the formerly infected countries of the Near East region.

Assistance was given to countries such as Iran, Israel and Cyprus, respectively, in the form of vehicles, equipment and vaccine in order to support any possible effort in limiting the spread of the disease toward Turkey and Europe.

When the SAT1 epizootic swept across the Anatolian peninsula and in autumn 1962 reached the European continent, the objectives of the campaign had to be concentrated mainly on setting up and maintaining buffer zones in south-eastern Europe, where there seemed to exist more favourable conditions for an organized and enduring control of the disease.

Because of the geographic position, livestock potential, movements and permanent exposure to any disease agent which may be introduced into the Near East region both from Asia and Africa, Turkey constitutes a natural avenue through which epizootics could easily reach the European continent. The Bosphorus, with its intensely concentrated human population, consumption centres, livestock markets and slaughterhouses, is the area where live animals, and thus diseases, converge day and night from any part of the Anatolian peninsula and Turkish Thrace. This important region has been given special attention by all experts and authorities concerned in the campaign as the keypoint of any action directed to avert the danger of the foot-and-mouth disease virus being conveyed into continental Europe.

The maintenance of buffer zones in Thrace, the control of livestock movements across the Bosphorus, the gradual improvement of disease control and prophylaxis in Anatolia have never been lost sight of since the inception of the campaign in 1962, both for the benefit of Europe and Turkey. In fact, even a partial solution of the problem - i.e. the full control of the situation in Thrace - will reopen good possibilities for export of Turkish livestock products into Europe.

The campaign which initially aimed at controlling the westward spread of the SAT1 foot-and-mouth disease virus in Europe had to be extended at the beginning of 1965 to include a second epizootic due, this time, to an exotic variant (Middle East variant A22) of the A type virus, one of the classical types of Europe. This variant spread from Iran, invaded all the Near East countries and, following the same path of the SAT1 epizootic, rapidly spread throughout Anatolia, reaching the Bosphorus, Thrace and the Greek border in a matter of a few weeks. In fact, in the span of two years, the same region was invaded by two epizootics, once in 1962 and the second time in 1964.

The greatest challenge to Europe was presented by the SAT1 virus in autumn 1962 and by the A22 virus in 1965 and spring 1966 with the infection reaching in all three instances the Greek territory very near the Turkish borders, within but not beyond the western limits of the buffer zones.

The application of vaccination on a large scale together with the adoption of severe sanitary measures, especially along the Greco-Turkish and Bulgaro-Turkish frontiers (including wheel baths at the frontier posts for all vehicles leaving Turkey), has been a determining factor in arresting the progress of the two viruses towards the west.

This result was consolidated by the vaccination of livestock throughout Turkish Thrace, carried out for three consecutive years through much effort on the part of the Turkish Government.

In the buffer zones all susceptible animals in a territory belt of 50-70 km depth, comprising both parts of the Greco-Turkish and Greco-Bulgarian frontiers, were vaccinated. The operation which has been carried out twice a year, in spring and autumn, has now completed its eighth stage.

In Anatolia ring vaccination has been carried out according to the circumstances and within the limits of the available vaccine. Turkey has taken part in the production of the vaccine necessary for this purpose.

Since 1964, Greece and Bulgaria have been producing the non-exotic vaccine (type O vaccine) necessary for a bivalent or trivalent vaccination of their own territories in the buffer zones.

Cyprus took an active part in the common effort to bring foot-and-mouth disease under control, initially with vaccine (SAT1 type) obtained by FAO and since 1964 with bivalent vaccine (O/A type) purchased from a European firm. For three consecutive years, more than 20,000 cattle and 600,000 small ruminants have been vaccinated in the country and no outbreak of FMD has been recorded in 1965 and 1966.

Annual polyvalent vaccination of the susceptible animal population against FMD has been carried out also in Israel with locally produced vaccines; the equipment obtained by FAO has helped markedly in raising the production capacity of inactivated vaccines in the Tel Aviv Institute.

With the funds of the campaign all in all 11,145,000 cattle doses of monovalent vaccine - in some instances combined to bivalent vaccine - were purchased for a total expenditure of US\$3,082,690.

To these supplies of vaccine there have to be added 1,050,000 doses of SAT1 vaccine which were given free of charge in 1965 by the French Government (to be converted into bivalent vaccine and some 600,000 doses of vaccine (European type) donated in the previous years by other countries (Germany, Belgium) on various occasions.

Table II shows the amount, origin and cost of vaccine distributed in the assisted countries since the inception of the campaign. It is of importance to note that vaccination against virus type A₂₂ alone involved an additional expenditure of nearly one million dollars. Since this includes also expenditure for surveys and vaccine testing in connection with the appearance of the virus A₂₂ late in 1964, it should be recalled, at this stage, that the timely identification and control (before having reached Europe) of the A₂₂ virus was made possible by the organization set up in 1962 to control the SAT1 virus.

Details concerning the evolution of the disease in south-eastern Europe and the vaccination campaigns, up to 1965 included, are available in the reports of the Xth, XIth, XIIth and XIIIth Session of the European Commission for the Control of Foot-and-Mouth Disease. As for the 8th stage of the campaign (spring-summer 1966), the following information may complete the picture.

Spring campaign and disease situation in 1966

The peak in the incidence of the A₂₂ outbreaks in Turkey was reached in June 1965. Since August of the same year, a marked regression of the disease incidence has been noted, particularly in Thrace as a result of extensive and repeated vaccination carried out with monovalent, bivalent (SAT1/A₂₂) and also trivalent vaccines (SAT1/A₂₂/O). On the other hand, an epizootic wave due to the same A virus subtype started in the Caspian area and swept across the Soviet Union, endangering the borders of some East-European countries in autumn 1965.

The disease position in Turkey during the first 6 months of 1966 was satisfactory as compared with the previous year, with 31, 29, 17, 35, 84, 149 outbreaks recorded in the whole of the country from January to June. During the second half of the year, the improvement in the situation was consolidated with 150, 32, 47, 55, 75, and 80 outbreaks recorded. However, a recrudescence of the O virus was noted towards the end of the year.

This applies in particular to Turkish Thrace where only a few outbreaks, all caused by virus type O, occurred throughout the year. It should be noted that virus type A was not recorded in 1966 and virus type SAT1 has not appeared for the third consecutive year in this important region of south-eastern Europe. The benefits of the previous vaccination campaigns in this area have been indeed remarkable, especially if due consideration is given to the intense traffic of animals and meat taking place in the Bosphorous region.

A matter of serious concern, however, is represented by the occurrence in the Near East region of an apparently new strain of virus type O which is different from the already known strains of the same type. Observations recently made in Iran confirm this supposition and specimens of virus collected in eastern Anatolia have been under study also at Ankara.

The vaccination program had to be arranged in conformity with the available funds and would not have been possible without the decision of Great Britain to contribute £100,000 worth in vaccine (April 1966) and the prospect of a contribution from the European Economic Community amounting to US\$350,000.

Therefore, the desire of Turkey to have the whole of Thrace vaccinated as in the previous biennium possibly with trivalent vaccine, could not be satisfied and the program had to be limited to a minimum, i.e. to the bivalent vaccination of the buffer zones and the most exposed provinces of Turkish Thrace.

With this in mind, 160,000 and 140,000 doses of SAT1/A22 vaccine were applied in Greece and Bulgaria respectively. 600,000 doses of SAT1/A22 vaccine produced by a French firm at Teheran were distributed to Turkey for use in Thrace. The vaccination of the buffer zones, both in Greek and Bulgarian territory, was completed before the end of May and the operations in Turkish Thrace were practically terminated in July.

These three countries made a commendable effort also on this occasion in organizing vaccination teams, in supervising the storage, distribution and correct application of the vaccines and in convincing the farmers and shepherds to submit all their animals to vaccination. The work of the vaccination teams in Greece and Turkey, particularly, has been satisfactory from every point of view.

Veterinary control has been very active, especially in the frontier areas where animals have been inspected at regular intervals; at the frontier posts wheel disinfecting baths were kept in operation when there was a danger of virus spread in the region.

An unexpected outbreak in Greek territory (very near the frontiers with Turkey) caused by virus A22 and followed by an outbreak of foot-and-mouth disease in Bulgarian Thrace just after the conclusion of the spring campaign (end of May) gave rise to serious concern. Fortunately, the disease did not spread any further in Greece and the Bulgarian outbreaks were attributed to a European strain of the A virus type. Despite all investigations the origin of the Greek outbreak could not be traced. For the rest of the year no A type virus was isolated in the whole of Thrace and only four O type outbreaks appeared in the regions from May to October.

Here again both the benefit of the previous prophylactic campaigns, the correct application and the efficacy of the vaccines in use became manifest. Much credit has to be given also to the veterinary authorities of the countries concerned for the prompt and energetic action taken in preventing any further spread of the exotic viruses.

For the first time, since the inception of the campaign, no vaccination campaign took place in the buffer zones nor in the rest of Thrace during the second half of the year. It is hoped that this will help in assessing the possibility of maintaining a favourable disease position by only one yearly vaccination of all susceptible animals in Turkish Thrace.

Assistance to Veterinary Services and Developing Institutes in the Region

Since the early stages of the campaign, assistance was given in the field of training experts. Turkey in particular was able to benefit from the almost continuous presence of experts, most of them officials of the British Veterinary Services. Training in disease control and quarantine was their main task. Since 1965 a specialist has been assisting Turkey in the development of vaccine production and organization of the new institute for FMD.

To meet the great shortage of transportation which would have seriously hampered an organized and proper application of the vaccine, funds were made available for delivery of refrigerated trucks, vehicles and automatic syringes, ear tags and pliers to the assisted countries. Turkey, Greece and Iran received a special 4-wheel drive refrigerated truck each, and 63, 17 and 7 jeeps respectively. Vaccination teams were

established and their work in Turkey and Greece, in particular, has been very satisfactory from all points of view.

Furthermore, laboratory equipment has been allocated to Turkey, Greece, Israel and Iran to the value of nearly US\$400,000. The procurement of material and laboratory equipment, including chemicals, meant intense activity on the part of the Secretariat of the European Commission, especially during the years 1963, 1964 and 1965.

The assisted countries, on their side, decided to construct either a new institute (Ankara) or new laboratories (Athens and Tel Aviv). Thanks to the assistance received, the Greek institute is now able to meet the local demand of vaccine, except exotic types. The product is regularly submitted to innocuity and potency testing with very good results. Most of the 5 veterinarians composing the staff have received special training in other western European institutes and are familiar with all the most advanced techniques in laboratory work. The construction of the new Turkish Institute has already involved an expenditure of 15,000,000 Turkish Lire, all incurred by the Turkish Government. The Institute is expected to be operational in 1967. In the meantime, the production of vaccine in Turkey is being carried out on a limited scale at Etlik (Ankara) with the assistance of an FAO expert. The production capacity has never exceeded half a million doses of vaccine. Nearly 200,000 doses of A22 vaccine were produced in 1966. The quality of the product, however, has reached a high standard so that in future large-scale production will only need better facilities at the new institute and adequate organization of work.

Technical assistance was given to Turkey and other countries by allocating fellowships to local technicians for study in Europe and in the United States. Also in this field, the collaboration of the European Institutes has been very generous and extremely useful in preparing the necessary conditions to enable these countries to become self-sufficient.

During 1966 alone, four Turkish veterinarians have spent several months in European institutes. Tissue culture techniques were the main object of their studies.

Financial situation at the conclusion of the eighth stage of the campaign

Table III shows the total expenditures incurred since the inception of the campaign for the purchase of vaccine, vehicles and laboratory supplies as well as for technical assistance and travel.

Expenditure for freight, insurance and, in some cases, for the installation of the purchased equipment in 1966 is not included in the table.

The available balance at the end of December 1966 was of \$220,000 which does not include 690,000 doses of vaccine in storage at Pirbright.

This excludes the possibility of carrying out extensive vaccination programs pending receipt of new sizeable resources.

When the SAT1 campaign was launched in 1962, the requested contribution was US\$2 per head of susceptible animal in Europe.

16 countries responded to repeated appeals by the Director-General and the global contribution in respect of the susceptible livestock population is given in Table IV.

Future activities and further financing of the campaign

The following points deserve consideration in planning the future activities:

(a) the danger of virus type A spreading into Southeastern Europe will continue in the foreseeable future;

(b) it is impossible, at yet, to exclude the presence of SAT1 virus in the Near East region, even if the virus has not been identified throughout Turkey since August 1965; therefore, some vaccine should be kept in stock for emergencies;

(c) the persistence and recurrence of virus type O in Turkey and the appearance of an apparently new strain of this type in Iran makes it advisable to foresee the necessity for bivalent vaccination (A22/O) of the buffer zones in the future; in view of the experience made with the SAT1 campaign and the lessening danger of a severe A virus epizootic in south-eastern Europe, the program could be reduced to one vaccination per year, provided adequate extension of the buffer zones, (including all of Thrace at least) is considered.

(d) the establishment of a second system of buffer zones along the south-eastern borders of Anatolia (as proposed by the Turkish veterinary authorities in order to prevent further invasions of Turkey and subsequently Europe by exotic animal diseases) will imply an additional effort, in particular as far as vaccine supply is concerned. In fact, Turkey will be in a position to carry out mass vaccination of the more exposed eastern border areas, mainly along the frontiers with Iran and Irak, if adequate supplies of vaccine are forthcoming. 1,200,000 doses of FMD vaccine (mono-, bi or trivalent according to the epizootiological situation) would serve the purpose.

This matter was discussed also at the FAO Regional Conference for Europe, held in Seville from 5-11 October 1966, where the necessity of preventing the spread into Europe of exotic types of animal diseases was emphasized by the adoption of the following recommendation:

"The Conference,

Considering the important role and the successful results obtained by FAO in co-operation in particular with WHO and the International Office of Epizootics, in the field of animal health and especially in the efforts to control and prevent the spread of exotic types of foot-and-mouth disease in Europe;

Taking note of the statements submitted by different delegations on the subject,

Considering that the prevention of the spread of exotic types of animal diseases to Europe is a very important problem for the maintenance and development of the European economy,

Requests the Director-General of FAO

1. To make a study of the possibility of creating a new buffer zone on the frontiers of the European Region where and when such action proves necessary in order to prevent the introduction or spreading of dangerous exotic types of animal diseases in Europe,
2. To suggest possible ways and means, both technical and financial, of implementing the recommendations of the above-mentioned study".

(e) Turkey will not be able during the next biennium to contribute substantially towards the supply of vaccine for the campaign since they are still engaged in the construction and the equipping of the new institute. Vaccine should be supplied to this country during the next two years, at least, for the maintenance of the buffer zones. Greece and Bulgaria are self-sufficient with regard to the production of O vaccine (European type) for the maintenance of the buffer zones on their territory. However the exotic valence of the vaccine has to be received from abroad.

(g) the supply of vaccine (against exotic types) to other European countries in case of emergency (a request from Poland this year could not be met) might be envisaged in order to avoid unnecessary manipulation of exotic viruses in the exposed but not infected countries in eastern Europe.

At its Vth meeting held at Brussels on 13 September 1966, (see appendix IIIa) the FAO/EEC/OIE Consultative Committee, in reviewing the progress of the SAT1/A22 campaign, stressed once again the significance of the Bosphorous region in the epizootiology and control of exotic FMD and the necessity of mass vaccination against the A22 virus in Thrace during spring 1967. The Committee also emphasized how important it would be to have stocks of vaccine readily available for immediate vaccination if an outbreak should occur in other areas of Europe possibly exposed to the invasion of an exotic virus, and suggested that ways and means should be investigated to be able to give assistance in this connection (see attached report). On the basis of these suggestions and of the proposals made for the extension of the buffer zones in south-eastern Europe, the following plan and the approximate expenditure are proposed:

(1) Maintenance of buffer zones in Europe (spring vaccination)	Approx. cost in US\$
- 500,000 doses of A22 vaccine for Greece and Bulgaria	137,500
- 700,000 doses of A22 vaccine for Turkish Thrace (available)	---
(2) Establishment of buffer zones in Eastern Anatolia	
- 1,300,000 doses of bivalent A22/O vaccine	500,500
(3) - 300,000 doses of A22 vaccine to meet first emergency in eastern Europe	82,500
(4) - 200,000 doses of SAT1 vaccine (to be used only in case of emergency)	55,000
(5) for technical assistance: experts, laboratory supplies	60,000

	835,500
	=====

Notes: The available balance in TF 111 will hardly permit the implementation of points (1) and (5), which correspond to the program carried out in the spring campaign 1966.

Revaccination of the buffer zones in autumn 1967 is not considered here.

Turkey is expected to produce vaccine for ring vaccination in Anatolia and for vaccination against O type in Thrace.

Conclusion

The results so far achieved in controlling two exotic viruses in south-eastern Europe are worth of special notice; the menace of the SAT1 virus epizootic was averted and the A22 virus epizootic was brought under control in Thrace. However, the danger of this latter virus spreading into Europe still persists and other exotic strains of the European types of virus (type 0 in particular) may become a serious problem in the near future. The usefulness and convenience of maintaining buffer zones in south-eastern Europe have been well demonstrated. The countries situated in the region have not the means to make this effort alone and furthermore the maintenance of buffer zones is a very valuable service rendered to Europe as a whole.

The expenditure involved for carrying out two joint campaigns in the span of 4 years has been approximately US\$1,000,000 per year, a very low cost, indeed, if compared with the losses experienced by Switzerland and the Netherlands in stamping out foot-and-mouth disease outbreaks in autumn 1965 (more than US\$6,000,000 each).

Finally, the continuation of the present collaboration between countries and international information would undoubtedly keep the interest alive and encourage more and more initiative on the part of assisted countries to improve their system of disease control and prophylaxis and, therefore, to consolidate the results so far achieved.

TABLE I

SAT1/A₂₂ campaigns in South-eastern Europe

List of contributions obtained in the period September
1962 - 31 December 1966 from different sources

A.	From individual European countries (other than EEC countries)-	<u>Totals</u>
	In cash (Trust Fund 97):	US\$
	Ireland (1962)	28,003
	Switzerland (and Liechtenstein) (1962)	79,500
	Austria (1962) (1966)	96,571
	Iceland (1963)	500
	Finland (1963)	15,505
	Yugoslavia (1963) (1965)	54,990
	Sweden (1963 - 1966)	91,812
	Denmark (1963) (1965)	135,680
	Norway (1963)	71,280
	United Kingdom (1964 - 1965)	574,068
	 * In vaccine (exotic types)	
	United Kingdom (1962-1963-1966)	616,000
	Israel (1962)	3,500

		US\$ 1,767,409
B.	From European Economic Community (T.F.111)	
	deposited in 1963	1,508,762
	deposited in 1964 and 1966	875,000
		2,383,762
C.	From FAO and the European Commission for the control of Foot-and-mouth disease (1962 - 1963)	112,000
		112,000
D.	From UN Contingency Funds (1962-1963)	
	(a) for Turkey	40,000
	(b) for Iran	30,000
	(c) for India, Pakistan, Ceylon and UAR	80,000

		150,000
	GRAND TOTAL	US\$ 4,413,171

* not inclusive of donations made by France (1,050,000 doses SAT1 vaccine) and by Germany, Belgium and Switzerland (550,000 doses of various European type vaccines).

TABLE II

SAT1/A22 Campaign - vaccines delivered as at 31 December 1966,
their destinations, suppliers and cost

Year and stage of campaign	Type (s) and cattle doses of vaccine	Destination (*) and doses supplied	Supplied by the Institute of	Price in US¢ per dose FOB or CIF
<u>1962</u> 1st stage (Autumn)	SAT1 555,000	T. 165,000 G. 290,000 B. 100,000	Pirbright	35¢ FOB
<u>1963</u> 2nd and 3rd stage	SAT1 1,938,000 O type 370,000	T. 650,000 G. 700,000 B. 550,000 C. 38,000 G. 120,000 G. 200,000 B. 50,000	Pirbright 1,500,000 ds. 400,000 " Tel Aviv Brussels Amsterdam Brescia, Ist. Zoopr.	35 ¢ FOB 28 ¢ CIF 34 ¢ FOB 12 ¢ FOB 9 ¢ FOB 12 ¢ FOB
<u>1964</u> 4th and 5th stage	SAT1 2,362,000 O type 450,000	T. 1,500,000 G. 400,000 B. 400,000 T. 62,000 T. 100,000 T. 200,000 T. 50,000 T. 100,000	Pirbright (600,000 ds) Teheran (IFFA) (1,700,000 ds) Tel Aviv Rome, Ist. Zoop. Brescia " " Perugia " " Lyons (IFFA)	28 ¢ CIF 32 ¢ CIF (500,000 da) 29 ¢ CIF (1,200,000 ds) 34 ¢ FOB 14 ¢ FOB 11.5 ¢ FOB 11.5 ¢ FOB 11.5 ¢ FOB
<u>1965</u> (Spring) 6th stage	SAT1 500,000 SAT1/O 300,000 SAT1/A 500,000 A22 200,000 A22 500,000	G. 200,000 B. 200,000 T. 100,000 T. 300,000 T. 500,000 B. 100,000 G. 100,000 T. 300,000 G. 100,000 B. 100,000	Teheran (IFFA) " " " Pirbright " " Teheran (IFFA) " " "	27.5 ¢ CIF " " " " " " 38,5 " " 42 " " 27.5 " " " " " " " " " " " " " "
(Autumn) 7th stage	A** 850,000	T. 500,000 G. 200,000 B. 150,000	" " "	" " " " " " " " "

TABLE II (contd.)

Year and stage of campaign	Type (s) and cattle doses of vaccine	Destination (*) and doses supplied	Supplied by the Institute of	Price in US¢ per dose FOB or CIF
1966 8th Stage (Spring)	SAT1/A ₂₂ 300,000	G. 160,000	Pirbright	42 ¢ CIF
		B. 140,000	"	21 ¢ "
	A ₂₂ SAT1/A ₂₂ 600,000	B. 20,000	"	21 ¢ "
		T. 600,000	Teheran (IFFA)	55 ¢ "

(*) T-Turkey G-Greece B-Bulgaria C-Cyprus

(**) Converted into bivalent A/SAT1, the French Government having donated the necessary quantity of SAT1 vaccine for this purpose.

Monovalent doses purchased: SAT1 type 7,055,000, A₂₂ type 2,970,000,
O type 1,120,000 Grand total 11,145,000 monovalent doses.

Total expenditure for 11,145,000 doses of vaccines : US\$3,082,690
(not inclusive of the 1,600,000 doses of vaccine donated by France,
Germany, Belgium and Switzerland.)

TABLE III

SAT1/A CAMPAIGNS IN SOUTH EASTERN EUROPE

Funds allocated for the purchase of vaccines, vehicles and laboratory supplies and for technical assistance and travel.

Period: June 1962 - December 1965

Expenditure incurred	Trust Fund 97	Trust Fund 111	UN Contingen- cy Fund and FAO Funds	Totals in US\$
<u>VACCINES (monovalent cattle doses) to Turkey, Greece, Bulgaria & Cyprus</u> SAT1 type: 7,055,000 A22 type 2,970,000 O type 1,120,000	*1,378,830	1,703,860		3,082,690
<u>LABORATORY EQUIPMENT and supplies (freight not included) to:</u> Turkey Greece Israel Iran India, Pakistan, Ceylon, UAR	3,000 3,316	147,200 86,690 106,880	**41,344 21,420 80,000	191,544 86,690 106,880 24,736 80,000
<u>Vehicles (Jeeps and refrigerated trucks) to:</u> Turkey (63 jeeps + 1 ref. truck) Greece (17 " + 1 " " Iran (7 " + 1 " ")	18,866	84,100 44,090	100,000 (in Turkish lire) 7,250	184,100 44,090 26,116
Experts, administration, project servicing costs, travel expenses	34,309	105,194	European Commission 12,000	151,503
TOTALS AND GRAND TOTAL:	1,438,321	2,278,014	262,014	3,978,349

* inclusive of US\$466,200 contributed by the U.K. in vaccine.

** inclusive of US\$13,595 spent for eartags and pliers allocated to Turkey, Greece and Bulgaria.

TABLE IV

SAT1/A CAMPAIGNS IN SOUTH-EASTERN EUROPE

Funds received from different countries following the FAO appeal in 1962 for a contribution of 2 US cents per head of susceptible animal in Europe.
(Trust Fund 111 and Trust Fund 97)

(as at 31 December 1966)

Country or group of countries	Number of ruminants and pigs	Contributions received in US\$	US¢ per head of animal
Ireland	10,055,000	28,000	0.28
Switzerland	3,402,000	79,500	2.32
United Kingdom	45,387,000	1,190,068	2.6
Austria	5,531,000	96,571	1.8
Yugoslavia	22,963,000	54,990	0.24
Finland	2,697,000	15,505	0.57
Iceland	847,000	500	0.017
Norway	3,564,000	71,280	2
Sweden	4,580,000	91,812	2
Denmark	9,590,000	135,680	1.4
++++	++++	++++	++++
European Economic Community	101,408,000	2,383,762	2.35

MINUTES OF THE 5th MEETING OF THE FAO/EEC/OIE
CONSULTATIVE COMMITTEE FOR THE SAT1/A₂₂ CAMPAIGN
held in Brussels on 13 September 1966

A meeting of the FAO/EEC/OIE Consultative Committee for the SAT1/A₂₂ Campaigns in south-eastern Europe was held in Brussels on 13 September 1966.

The meeting was attended by:

Dr. H. Steiger
Dr. R. Wanzeele
Dr. H. Hoffman

} European Economic Community

Mr. John Reid, Chief Veterinary Officer, U.K.

Dr. Ervin A. Eichhorn
Dr. G.M. Boldrini

} FAO

Dr. Vittoz, Director of OIE, delegated Prof. R. Willems to represent OIE.

Dr. John Reid represented the individual European countries, not Members of EEC, contributing to the campaign.

A report was prepared by the Secretariat of the European Commission for the Control of Foot-and-Mouth Disease for this Meeting, which represents a review of the campaign since its inception to 31 August 1966. A list containing all items of equipment supplied during the campaign to the developing laboratories in Greece and Turkey and the financial situation of Trust Funds 111 and 97 as at 31 July were submitted.

The Committee reviewed the various phases of the campaign from its beginning to the present time. The main facts during the evolution of the SAT1 epizootic were recalled, especially the action taken during 1962 and 1963 as well as during the epizootic, due to the A₂₂ virus (variant of the A strain), and the initiatives taken by FAO in collaboration with the European Economic Community and OIE to meet the emergency situation and to organize ways and means for controlling the disease in the assisted countries.

The Committee has unanimously recognised the excellent results obtained up to the present time, and particularly that, with a relatively limited expense, the progress of two epizootics towards Europe was stopped at the south-eastern borders.

It was noted with satisfaction that the SAT1 virus has ceased to constitute an immediate danger for Europe and that the A₂₂ virus has lost great part of its aggressiveness thanks to prophylactic and veterinary control measures adopted particularly in Thrace.

The participation of the directly exposed countries in maintaining the buffer zones established at the Greek, Turkish and Bulgarian frontiers by organizing biannual vaccination of all susceptible livestock was emphasized. The Secretary of the European Commission reported on the sanitary situation concerning foot-and-mouth disease in the south-eastern European region. It was felt that the fact that no outbreaks had been reported in Turkish Thrace for quite some time was the most salient result of the campaign in 1966 and a further demonstration of the efficacy of the vaccines employed up to now in south-eastern Europe.

However, the occurrence of a foot-and-mouth disease outbreak due to A₂₂ virus in May in Greek territory, a few kilometers from the Turkish border, on the other hand, has shown the importance of maintaining these buffer zones of regularly immunized animals also in future.

At this point the future program was examined both under the light of the results obtained and of the funds remaining from the contributions of the European Economic Community and other individual European countries.

The Committee took note of the progress made in Greece to make the country self-sufficient with regard to vaccines which formerly had to be imported in considerable quantities. With the equipment supplied during the campaign the required amounts of non-exotic vaccines needed can be produced. The imminent construction of a new wing at the Institute at Aghia Paraskevi will allow for better working facilities and for a further increase in production capacity.

As far as Turkey is concerned, the Committee noted with satisfaction the importance of the efforts made by the Turkish Government in constructing a new Institute entirely dedicated to foot-and-mouth disease. The Secretary reported that the Institute will become operational in 1967 but that a satisfactory production capacity cannot be expected before 1968. The organization for the production on an industrial scale, in fact, will still require great efforts on the part of the Turkish authorities.

Consequently, Turkey will not be able to contribute in the near future substantially to the maintenance of the buffer zone with locally produced vaccine. Since this problem is of general interest, the European countries will have to supply the necessary vaccine for a further period in order to maintain efficient buffer zones.

In this connection, the attention of the Committee was drawn to the important role the region of the Bosphorus will continue to play in future for Europe, because of the intense traffic of animals which, from Anatolia, converge towards Istanbul. It cannot be excluded that after the invasion of the SAT1 and the A₂₂ virus into this region, the danger of the sudden appearance of another strain of virus exotic to Europe may persist. Virus strains of type O, apparently different from those known in Europe, were isolated recently in the Near East region.

These considerations add to the significance and importance of Anatolia for the epizootiology of foot-and-mouth disease as well as to the functions the new Institute of Ankara may be called upon to carry out. In order to be able to examine these problems more closely, the Committee decided to hold another meeting next spring, possibly in Ankara. As far as the continuation of control measures in Thrace are concerned, the Committee expressed its unanimous opinion that the system of bivalent SAT1/A₂₂ vaccination of the buffer zone twice a year should be reduced to one vaccination only starting with the current year. Consequently the autumn vaccination will not be carried out, but a stock of monovalent A₂₂ and SAT1 vaccines will be held in readiness to meet possible emergency situations.

The next vaccination campaign in the buffer zones will, therefore, be carried out in spring 1967 with A₂₂ vaccine only and will possibly be extended to all of Thrace.

To this end, about 690,000 monovalent doses of A₂₂ vaccine will be made available which will represent the quantity of vaccine (on the basis of US\$ 21 per dose) remaining from the contribution of the United Kingdom of £100,000.

The further amount of vaccine needed for the spring campaign in 1967 will be purchased with the uncommitted part (about US\$180,000) of the contribution of US\$350,000 by the European Economic Community.

The Committee then discussed the other areas in Europe possibly exposed to the invasion by exotic viruses and it was pointed out how important it would be to have stocks of vaccine readily available for immediate vaccination if an outbreak, due to an exotic virus, should occur and to avoid manipulation of exotic viruses by directly exposed countries which, in this case, would be automatically considered as infected. Ways and means should be investigated to be able to assist promptly such countries and to emphasize that such manipulation of exotic viruses should be undertaken only after consultation with the international agencies concerned.

Finally, the Committee noted the precarious situation of funds intended for the campaign as at 31 August (US\$14,000 available in both Trust Funds 111 and 97) and reserved the right to examine other possibilities of financing the campaign in order to continue beyond spring 1967. Such a decision can only be taken after discussing the matter at the next meeting in early spring which will probably take place in Ankara.

REPORT OF THE EXECUTIVE COMMITTEE

The activities of the Commission since the XIIIth Session (22-24 March 1966) followed similar outlines as those of the program of work initiated in 1962 with the participation in the campaigns against exotic foot-and-mouth disease in south-eastern Europe and the Near-East. On one hand, the traditional, ordinary work of the Commission has been carried out in conformity with its Constitution, and on the other hand, the action commenced in 1962 to control the spread of the SAT₁ virus towards Europe was continued and extended to the new epizootic caused by the Near-East variant of virus type A (A₂₂).

1. Campaigns in south-eastern Europe (and visits by the Secretary in Turkey and Iran).

These involved, as in the previous years, much activity on the part of the Secretariat of the Commission both at Headquarters and in the field. In particular, close contact was kept by correspondence and by repeated visits (see later) with members of the FAO/EEC/OIE Consultative Committee, as well as with the veterinary authorities, FAO representatives and experts concerned in the organization and carrying out of vaccination campaigns and surveys in Turkey, Greece, Bulgaria, Iran and other countries. The procurement of additional equipment was decided to facilitate the organization of the work in the Turkish laboratories. Serious administrative problems involving the procuring of A₂₂ vaccine for the campaigns had to be solved at a time when the latest contribution of EEC had only been promised and when the new virus was seriously endangering the Greek borders within the buffer zones; arrangements were made to ensure special training for three veterinarians in specific fields of foot-and-mouth disease work (as for instance the technique of tissue cultures in cell suspensions) and to assist these fellows during their stay in western Europe; information had been collected with the collaboration of several experts working in the region on the pattern of foot-and-mouth disease in the Near-East in general and the epizootiology of A₂₂ virus in particular.

The work related to the campaigns and surveys in south-eastern Europe and in the Near-East was carried out in regular consultation with the Chief of the Animal Health Branch of FAO and the Chairman of the Commission. Reports of these activities were submitted to the Vth Meeting of the FAO/EEC/OIE Consultative Committee in Brussels on

13 September 1966 (see appendix to the report on the FAO Campaigns, 14/67/4) and to the meeting of the Executive Committee in Dubrovnik on 12-14 October 1966 (App. I). At this latter meeting, the Secretary reported on the position of foot-and-mouth disease in south-eastern Europe, the vaccination program carried out during the spring campaign against virus type A₂₂ and the need for additional funds to enable further deliveries of vaccine to be made during 1967 and 1968. The Executive Committee concurred with the statement made by the Delegate of Italy that the success obtained in halting the spread of the various epizootics at the south-eastern borders of Europe clearly demonstrated the value of the Commission and the benefits that Europe derives from the coordinated efforts of European countries with regard to foot-and-mouth disease.

Mainly connected with the SAT₁/A₂₂ campaigns was the visit paid by the Secretary to Turkey and Iran on 17-29 October 1966. In Turkey, the Secretary noted the important progress made in the control of foot-and-mouth disease during 1966, particularly in keeping Thrace almost free from the disease throughout the year, and of the determination of the Veterinary Authorities to proceed as soon as possible to the establishment of a second system of buffer zones in eastern Anatolia. Europe is expected to participate in this effort, since the ultimate benefit of this action will be reflected on the continent as a whole. At Ankara the many problems relating to the organization of work in the new Foot-and-Mouth Disease Institute were again discussed with the FAO expert, the veterinary authorities and the local staff at the foot-and-mouth disease laboratories. It was gratifying to note the great progress made during the last year in the field of vaccine production. Although the quantities produced were of much the same order as in 1965, the quality of the product marked further progress, compared with previous years; this was evident from examination of the protocols of innocuity and potency testing carried out in recent years. The collaboration between the FAO expert and the local staff has been very fruitful and a sound basis has been created for future work related to the production of vaccines on an industrial scale.

At Ankara, the Secretary discussed, both with the Turkish authorities and the FAO resident representative, some projects and plans which the Turkish Government is working out and to some extent had already implemented, to solve the difficult problem of supplying meat to the western markets in Turkey. New industrial slaughterhouses will be constructed in eastern Turkey in towns situated in the center of livestock-rich areas, viz: Urfa (600,000 cattle and 4,000,000 sheep), Elazig (500,000 cattle and more than 2,000,000 sheep) and Van (300,000 cattle and 2,300,000 sheep and goats). The plan for transferring the municipal slaughterhouse and market of Istanbul to the Asiatic part of the Marmara Sea is also envisaged. The implementation of these projects will contribute substantially to the reduction of transportation of live animals over long distances across Anatolia, thus lessening the chance of infected animals being moved from one part of the country to the other. Studies and proposals in this respect have been made by FAO and the Commission since the inception of the SAT₁ campaign and credit should be given to the Turkish veterinary authorities for having been able to obtain, by their Government, full consideration for this important issue.

The object of the visit to Iran was to study the epizootiological situation in relation to types and variants of the foot-and-mouth disease virus present in this country and to study production capacity and possibilities of applying extensive vaccination in the field.

At the Razi Institute, Prof. Traub informed the Secretary of the studies he is making on the attenuation of various strains and on the serological variations of foot-and-mouth disease viruses in Iran. From research recently carried out, it appears that certain strain of the type O virus isolated in 1965 and 1966 differ definitely from those previously isolated in the region. At present, the problem is still open as to whether and to what extent the noted differences may affect the preparation of the vaccines needed in the region. French workers in the same institute have been carrying out immunological studies of the exotic A virus strains present in Iran in comparison with those (A₁) of the USSR and of the O strains (Iran) in comparison with the European type O strains. The latter investigations should furnish an indication of the practical value of some European vaccines in protecting against the Iranian strains.

Large quantities of vaccine can be produced at Teheran, mainly by the French unit which uses the Frenkel technique with epithelium sent from Europe. However, foot-and-mouth disease vaccination programs in Iran are still limited. This is due also to the difficulty of internal communications and scarcity of adequate means of transportation. Consequently, the establishment of buffer zones along the Turkish-Iranian borders may result in technical difficulties on Iranian territory.

This journey afforded the Secretary a good occasion to discuss in the laboratory of Dr. Ozawa, Razi Institute, recent developments in the techniques of vaccine preparation against African horse sickness.

2. Surveys in Bulgaria and Bthiopia (Importation of African boned meat)

The Chairman and the Secretary of the Commission visited Bulgaria and Bthiopia during the first part of May 1966.

The main object of this trip was to verify the organization set up and the precautions taken to prevent introduction of foot-and-mouth disease viruses by frozen meat imported from Erithrea into Bulgaria. In both Bulgaria and Erithrea the mission was accompanied by Professor A. Popov, the Director of Veterinary Services, Bulgaria.

The mission visited the harbour area of Varna, Bulgaria the meat plant where once or twice monthly shipments of about 400 tons of boned and frozen meat arrive from Massawa in Bulgarian boats which are specially equipped for this purpose. In Brithrea the mission was able to see how the collection, quarantine and slaughter of cattle intended for Bulgaria was handled and how boned meat is prepared, frozen and stored prior to shipment to Varna. The Chairman and the Secretary of the Commission proceeded then to Addis Ababa and to Diredawa where an opportunity was offered to see another similar organization (Chandris Company) operating in the Harar region.

During the travel in Bthiopia contacts were made with all veterinary authorities and experts who were able to give information on the sanitary position of the regions concerned.

The results of these visits were:-

(a) The Bulgaro-Bthiopian enterprise. The 'Rodopa' Company, a Government organization controlling the trade in animals and livestock products in Bulgaria, is the major shareholder of the 'Red Sea Development Corporation', the Bulgaro-Bthiopian company, which was founded in Erithrea for the supply of livestock and fish products to Bulgaria. Cattle are collected and quarantined for 30 days, and are then slaughtered in a new

abattoir near Cheren, built by the corporation and staffed by Bulgarian personnel. The boned quarters are taken to Maseaua under optimal transport and refrigeration conditions where the meat is frozen and stored prior to shipment to Varna. Quarantine and meat inspection services are carried out by Bulgarian veterinarians under the direction and supervision of their national veterinary services. The quarantine camps are located in a fenced area near Tessenei, and consist of numbered pens. Three veterinarians control the collection and quarantine of the animals which are vaccinated against rinderpest and subjected to strict observation for at least three weeks before being moved to Cheren, where a further observation period of 8-10 days is effected prior to slaughter. The temperature is taken of each animal before slaughter. Ante- and post-mortem inspections are carried out by an adequate number of veterinarians. The slaughter and cold storage facilities and the refrigerated trucks, as well as the means used for the transport of animals from the quarantine area to the slaughterhouse, belong to the company and are excellent and well kept from all points of view. Cleaning and disinfection are carried out under veterinary supervision in stations specially equipped for this purpose.

The mission found that the general condition of the animals awaiting slaughter at Cheren was good. Leanness was however prevalent in spite of four weeks' special feeding in quarantine. In fact, feeding constitutes a serious problem under the prevailing conditions in Brithrea and has a bearing on the final cost of the exportable product.

Handling and processing of the African meat in Bulgaria.

At its destination the meat is unloaded and taken by special isothermal trucks to a factory (an old meat plant especially adapted for this purpose) located in the same harbour area of Varna, in a fenced-off compound to which neither animals nor unauthorized persons have access.

In the factory the meat is stored until processed, which consists essentially of a short ripening period after thawing, mixing with pork, salting and conversion, by cooking and smoking, into 5 or 6 different kinds of sausages.

Heating must be carried out at 70°C and must confer to the end product the characteristics and aspects of cooked meat. (At the inspection, the cut surface of the sausages has to leave no doubt in this respect).

The plant is divided into two sections: the 'potentially' infected section is subject to special security measures to exclude safely the escape of virus with personnel, materials and effluents. The personnel of the plant leave their clothes (with exception of underwear) in the dressing rooms and put on protective clothing and special boots. The dressing rooms have showers.

Sanitary control measures are applied under the supervision of three veterinarians who are also responsible for the correct application of all precautions and measures taken, including the processing of the meat products, to ensure destruction of any virus which might have been introduced. All effluents of the plant are chemically sterilized in septic tanks before being discharged into the sea.

The overall impression of the mission was, in general, favourable especially in so far as the measures applied at Varna are concerned to ensure the safe processing of the meat brought in from Africa. As to this latter point, the mission appreciated the great financial efforts

made in Africa by the Bulgaro-Ethiopian Company in organizing and directing all operations from the purchase and quarantine of the animals to the obtaining and storage of the frozen meat. Under the prevailing conditions in Ethiopia, however, it cannot be excluded with certainty that foot-and-mouth disease virus may sometimes have access to the animals purchased for slaughter, even if foot-and-mouth disease has not been officially reported in this region in recent years. In fact, sporadic cases of disease are known to occur from time to time among indigenous cattle in Eritrea; the disease is generally mild in them, but wild ruminants and warthogs are frequently found dead in the course of an outbreak. This latter observation, according to the Director of the Veterinary Service in Eritrea, is sometimes the sole indication of the presence of foot-and-mouth virus in an area. Epizootiology and incidence of foot-and-mouth disease were also discussed at Addis Ababa and Diredawa with officials from FAO and of the British and the French Missions. It was generally agreed that foot-and-mouth disease has not been found to be a problem of great concern in Ethiopia, at least in recent years. Sporadic cases only have been reported or observed on a few occasions and virus type O was, on the basis of the few specimens sent to Nairobi or Pirbright for typing, the causal virus.

Unfortunately, the lack of an organized veterinary service may jeopardize, even for a long time, initiatives and efforts aimed at creating and maintaining disease-free areas with a view to the preparation, without any risks, of fresh meat to be exported to Europe.

(b) The 'Chandris' enterprise at Diredawa. At Diredawa, the mission visited the slaughterhouse of the Chandris Company and discussed the sanitary position of the region (Harar) with the field veterinary officer of the French mission. The slaughterhouse is new and equipped according to very modern criteria. Two veterinarians are in charge of meat inspection and the approved carcasses are sent under refrigeration conditions to Djibouti where they are either canned or frozen before being sold on the market or turned over to the army. A special treatment is applied by the same firm at Djibouti to the meat destined for some European industries. Sterilization by autoclaving and subsequent freezing are applied; this meat is exported in polythene bags together with the canned extract obtained during cooking, and is used for the production of meat sauce, ragout etc.

The sanitary position of the Harar region has been very satisfactory in recent years, especially since vaccination against rinderpest has been regularly carried out. In several years of activity, the French mission was informed on only two occasions of the presence of foot-and-mouth disease somewhere in the region.

A full report of the visits to Ethiopia was presented at the Meeting of the Executive Committee of the Commission at Dubrovnik, Yugoslavia on 12-14 October 1966. An account of the information collected and the results of the contacts established with the veterinary service in Eritrea and the veterinary experts working in many other Ethiopian regions were discussed by the Committee. Referring in particular to the Bulgaro-Ethiopian enterprise, some delegates expressed some reserve on the 'safety' of the importation of frozen meat from Ethiopia into Europe, despite all the precautions taken at both the origin and destination. At any rate, the good organization set up by the Bulgarian authorities in this respect was appreciated.

3. Meetings of the Commission's Committees

A. Meeting of the Research Group of the Standing Technical Committee

In collaboration with the Director of the Animal Virus Research Institute, the Secretary organized the annual meeting of the Research Group of the Standing Technical Committee of the Commission at Pirbright on 12-14 September 1966.

The main subjects under discussion at the meeting were: innocuity and potency of inactivated vaccines; vaccine production from cell cultures; immunisation of pigs; immunisation of sheep; structure of foot-and-mouth disease virus; epidemiology (sub-types, variants, carrier state, etc.); Details on the papers presented and the summaries of the discussions and demonstrations are given in Appendix IVa. The full report which includes all original papers presented at the meeting will be circulated to Commission members and laboratories and to all other interested parties.

The Meeting at Pirbright concluded a group of meetings (Amsterdam 1964, Lyons 1965, Pirbright 1966), which afforded a good opportunity to discuss many aspects of the problems related to testing of inactivated vaccines, and in particular, to the use of animals other than cattle for these tests, to immunization of pigs and sheep, and to the new developments in BHK cell cultivation techniques.

At the meeting in Dubrovnik, the Executive Committee was informed of the intention of the Research Group to hold its next meeting at the Plum Island Laboratory (U.S.A.) thus accepting the official invitation extended to the Group by the Director of this Institute. The main purpose of this meeting is to have an exchange of views between American and European experts on recent developments in foot-and-mouth disease research and prophylaxis. The dates of the meeting are set for 26-29 September 1967.

B. Executive Committee Meeting, Dubrovnik, 12-14 October 1966

The meeting was organized by Dr. S. Mihajlović and was attended by all regular members of the Committee. Several high officials of the Yugoslav Government and the Chief, Animal Health Branch, FAO also participated in the meeting. The discussions consisted mainly in (a) a review of the disease situation in Europe; (b) the progress in the SAT₁/A₂₂ campaigns in south-eastern Europe; (c) surveys and visits made in Europe and Africa; (d) administrative matters and proposals for a revision of the scale of contributions.

The continuing improvements of the foot-and-mouth disease situation in Italy, following annual vaccination campaigns in the northern part of the country were noted. The epizootic caused by virus type C in the Netherlands, the measures taken to control the disease and the policy recently adopted to vaccinate pigs were related by the Director of Veterinary Services, Netherlands. The particular aspects of the occurrence of foot-and-mouth disease in Denmark and Great Britain were brought to the attention of the meeting. The situation in Austria and other central European and Balkan countries was the subject of statements made by the Chairman of the Commission, the Yugoslav delegation and the Secretary.

The Secretary also gave a report on the campaign carried out in south-eastern Europe and the activities of the Secretariat in this connection. The reasons for suspending vaccination against SAT₁ virus and the dropping of the autumn campaign in favour of the spring campaign 1967 were explained.

The results of the visits carried out to Bulgaria and Ethiopia in connection with the importation of frozen meat into Europe are already mentioned in this report.

The question of increasing the contributions of the Commission's Member Countries was again discussed. It was generally felt that, since the contributions have not been raised for the past 12 years, a proposal should be made at the next Session of the Commission for an increase of about 20-25 per cent.

In addition, the Committee was informed by the Secretary of the results of his participation in the meeting of the Research Group at Pirbright (Appendix II) and the Symposium on International Traffic in Animals in the Near East region held at Beirut on 27-30 September 1966.

The delegate from Denmark informed the meeting of the decision of his Government to purchase 200,000 doses of A₂₂ vaccine in view of the situation which arose through the spread of this virus in eastern Europe. Some members suggested that, should the use of this vaccine not be required before March 1967, it could be handed over to the Commission for application, before expiry, in the 1967 spring campaigns in south-eastern Europe.

A summary of the report on the Dubrovnik meeting is attached in Appendix IVb.

4. Travels and other activities of the Secretariat

Visits to UAR and Greece, May 1966. On his way back from Ethiopia, the Secretary visited the Veterinary Institutes at Dokki and Abbasia (Egypt) and discussed with Dr. Ayoub, Director of these Institutes, the veterinary organization of the country with particular reference to the diagnostic facilities of which a remarkable expansion all over the 'delta region' is envisaged. As far as foot-and-mouth disease is concerned, sporadic cases only of non-exotic types have been recorded in the last few years. The local authorities, however, are concerned about the possibility of foot-and-mouth disease being introduced into the U.A.R. At Abbasia, the Secretary visited a building which is to house the foot-and-mouth disease laboratories in a not too distant future. Adequate installations and equipment may be secured through the assistance of international bodies. Specialized personnel is already working at Abbasia in the field of tissue culture, an experience which might help consistently.

In Greece, the Secretary discussed with the Director of Veterinary Services the results of the spring vaccination campaign against the SAT₁, A₂₂ and O viruses in the eastern part of the country. In the Institute at Aghia Paraskevi, vaccine production and other problems were discussed with particular reference to the expansion of the production capacity. The local requirements of European types of vaccine are now being met by the good use of the equipment supplied by FAO.

OIE Sessions

The Secretary attended the XXXIVth Session of OIE held in Paris on 23-28 May 1966 and the meeting of an expert panel for the study of live, modified foot-and-mouth disease virus-vaccines also held in Paris on 14-17 December. As far as the second meeting is concerned, the conclusion was that further studies are necessary before a live, modified virus can be admitted for the vaccination of animals intended for export. With regard to the use of live, modified virus within a country, experience is accumulating, sometimes with promising results, but there is no reason as yet, in the European regions at least, to discontinue the applications of inactivated in favour of modified vaccines.

Symposium of International Traffic on Animals in the Near-East Region,
Beirut, 27-30 September 1966

The Symposium was organized by the Near East Animal Health Institute and was attended by representatives or observers from several Arab countries, Turkey, France, FAO, OIE, and WHO.

The Secretary participated in the discussions and, in particular, drew the attention of the assembly to the joint recommendation made at a meeting in Brussels on 26-27 June 1960 when the problems connected with the importation into Europe of meat and animals was discussed by officers of the European Commission and OIE Permanent Commission for Foot-and-Mouth Disease.

The meeting offered an excellent opportunity to the countries of the region to exchange information on their respective sanitary situations, views on the control of the main epizootics, including foot-and-mouth disease, and to FAO officers to suggest ways and means by which a more efficient discipline of the animal movements could be achieved. In fact, the great pressure placed on the veterinary authorities in the Near-East, because of the increasing demand for food of animal origin, leads very often to the uncontrolled introduction into the region of animals - only live animals are mostly wanted for obvious reasons - from countries which are not free from diseases exotic to Europe. The failure of not requesting adequate quarantines from the exporters, as pointed out by the Secretary at the meeting, has the effect of both favouring the introduction into the region, and ultimately into Europe, of exotic diseases, and of discouraging or inhibiting, in some exporting countries, any good initiative aimed at the establishment of an efficient veterinary service. The principles of admitting importation from disease-free areas only and of giving preference to the importation of meat instead of animals, whenever possible, were incorporated in the final resolution of the Symposium.

Visit to the Istituto Zooprofilattico, Brescia, Italy, 18-30 July 1966

As in previous years, the Secretary spent a few days at the Institute in order to collect information on the latest developments in vaccine preparation techniques. In particular, he noted a great expansion in the industrial production of tissue culture by the massive use of revolving one liter bottles and the first encouraging results obtained at the industrial level, in the technique of virus culture in suspended cells.

On this occasion, the Secretary arranged for special training of two Turkish fellows in the latest techniques of cell culture in suspension.

Review of Russian publications on Foot-and-Mouth Disease

In collaboration with the Istituto Zooprofilattico, Brescia, selected papers dealing with foot-and-mouth disease are being translated from Russian into French and circulated to the member countries. Thirteen such papers have so far been translated.

Future activities of the Commission

The Commission will continue to promote and encourage national and international action for the control of foot-and-mouth disease in Europe. To this end, close contacts will be maintained with Government authorities, OIE and other specialized agencies and institutes. When necessary, the Secretary will visit European veterinary services and institutes and collect

information on the progress of disease control, vaccination schemes, vaccine production techniques and research on foot-and-mouth disease.

The member countries of the Commission, in turn, should furnish the Secretary with all the information which could be of use to him in view of the activities to be carried out, in compliance with the Constitution of the Commission. The prevention of the introduction of exotic types or strains of foot-and-mouth disease virus into Europe will continue to receive the fullest attention. As far as the campaigns against exotic viruses in south-eastern Europe are concerned, the activities of the Secretariat will be much along the lines of those in previous years; visits will be made to countries engaged in the maintenance of buffer zones or in preparing the necessary means to meet new emergencies; in accordance with the availability of funds, in Trust Funds 111 and 97, assistance will continue to be given to the developing foot-and-mouth disease institutes in south-eastern Europe. Particular attention will be given to the evolution of the situation created by the presence of virus type A22 in eastern Europe with a view to the steps to be taken by the Commission and FAO, should an emergency occur.

The evolution of the disease in Western Europe and, in particular, the occurrence and significance of new virus strains or variants will be closely investigated.

Studies, enquiries, and if necessary, surveys will be made by the Secretary on the risks and possibilities that foot-and-mouth disease may be introduced into Europe through importation.

REPORT OF MEETING OF THE RESEARCH GROUP OF THE
STANDING TECHNICAL COMMITTEE
HELD AT THE ANIMAL VIRUS RESEARCH INSTITUTE
Pirbright 14-16 September 1966

Following the decision taken during a meeting of the members of the Research Group of the Standing Technical Committee at Lyons, 1965 a meeting was held at the Animal Virus Research Institute, Pirbright, England, on 14-16 September 1966. The Meeting was organized by and held under the Chairmanship of Dr. J.B. Brooksby, Director of the Animal Virus Research Institute.

The following Agenda were approved:

1. Innocuity and potency of inactivated vaccines
2. Vaccine production from cell cultures
3. Epidemiology
4. Structure of foot-and-mouth disease virus
5. Immunisation of pigs
6. Immunisation of sheep.

A large part of the Meeting consisted of laboratory demonstrations and discussion of the research work in progress in the various sections of the Institute. In addition to the members of the Research Group (Dr. J.B. Brooksby, Prof. R. Willems, Professor B. Ubertini, Dr. B. Michelsen and Dr. J.G. van Bakkum), Dr. G.A. Moosbrugger (Secretary-General of the Permanent OIE Commission for Foot-and-Mouth Disease), most of the research workers of the Animal Virus Research Institute, representatives of the national laboratories of Belgium, France, Greece, Turkey and the U.S.A., a delegation from IFFA Laboratories, and some observers, were present. The Secretariat of the Meeting consisted of Dr. G.M. Boldrini, Sir Thomas Dalling and Miss D. Guarino.

Twenty papers were presented for discussion at the Meeting.

PLENARY SESSIONS

1. Innocuity and potency of inactivated vaccines

Dr. Mackowiak (IFFA) presented a report on the quantitative control in guineapigs of inactivated monovalent and trivalent foot-and-mouth disease vaccines. It concludes the series of reports on this subject: earlier reports were given at meetings of the Research Group at Amsterdam

in 1964 and at Lyons in 1965. This topic was referred by the Commission to the Research Group in order to evaluate the possibility of making use of guineapigs in the routine potency testing of foot-and-mouth disease vaccines.

The team of IFFA was able to confirm a direct correlation between cattle and guineapigs in their response to vaccination with foot-and-mouth disease vaccine and to establish the number of vaccinating doses (PD 50), able to protect 50% guineapigs, contained in one cattle dose of inactivated vaccine. From this value, which expresses the average potency of the vaccine for the guineapig, the average potency for cattle may be deduced and consequently, the average percentage of protection for cattle. The relationship between the 50% guineapig protective dose and the 50% cattle protective dose varies from strain to strain and must, therefore, be established for each of the strains used in the composition of the vaccine. Under these conditions and using guineapigs suitable for this purpose, (Pirbright strain), the number of cattle needed for the control of vaccines can be considerably reduced also in the case of trivalent vaccines.

In the discussion it was recognised that the guineapig-cattle relationship implies perfect stability of the virus strains and consequently requires an accurate and periodical control of the strains used in the production of the vaccine.

Dr. Lucam (Lyons) and Dr. Gayot (Alfort) illustrated the results of the official control tests of foot-and-mouth disease vaccines, carried out in the laboratories at Lyons and Alfort respectively. Both agreed that the extension of innocuity and potency tests to the great majority of batches of vaccines produced in France, has made contributions to the increase of the average quality of French vaccines. Expressed in values according to the K index estimation (Lucam test), the quality has gradually increased from 1960 to the average value of 2.3 in 1961, 2.35 in 1962, 2.55 in 1963 and 3 in 1964. In 1965, there was further improvement which would correspond to a protection of 98% in cattle. According to Prof. Lucam, the use of guineapigs for the control tests carried out in conformity with the French regulations, makes it possible to dispense with the use of cattle in 70 to 80% of the cases. No batch of vaccine was rejected in the official control tests carried out on the 150 batches in his Institute (Lyons) during 1965.

Dr. Gayot, referring to the results of control carried out at Alfort on 87 batches (campaign 1965/66) confirmed the points of view expressed by Dr. Lucam and added some observations on the statistical interpretation of the results obtained. He confirmed the absolute innocuity of all vaccines presented for control. In a comparative study of the K index values carried out in 1965 for the O valence, (K=2,97), A (K=2,81) and C (K=2,94), the conclusion reached was that the variance of A valence is significantly greater than the variances of the C and O valences, and it appeared, therefore, that the K index values for A valence are more widely distributed than for O and C valences.

This seems to confirm what has appeared also in the experiments carried out by IFFA, i.e. there is a greater variability in immunity response to type A vaccine than to type O and C vaccines.

Dr. Fagg (Pirbright) presented a preliminary report on the use of rabbits for the assay inactivated vaccines, which indicated that the response

of the rabbit to inactivated foot-and-mouth disease antigen is proportional to the amount inoculated. For consecutive tests to be comparable, it is essential to use rabbits of one breed only, but within the breed, sex and age do not appear to influence the response. The antibodies produced by the rabbit in response to inactivated antigen is proportional to that produced by cattle in response to the same antigen. As the antibody level in cattle corresponding to their protection can be ascertained (colour test), it is concluded that vaccine giving an antibody response in rabbits above a determined minimum, would protect cattle against virulent virus challenge. The results so far reported apply to one virus strain only. Research is now required to ascertain if similar results apply to other types of the virus.

2. Vaccine production from cell cultures

The progress obtained during the past years in the Institutes of Firbright and Brescia in cultivating BHK 21 cells in deep suspension culture for the production of foot-and-mouth disease virus was illustrated respectively by Dr. Capstick (Firbright) and Dr. Nardelli (Brescia).

Apart from some minor details, for example the method of agitation, the cultivation of BHK 21 in deep suspension culture is based on the same principles in both Institutes. This applies in particular to the cell line, culture media and automatic control of temperature and pH. A small difference in the preparation of vaccine with virus so cultivated is that Firbright has been using acetylethyleneimine (AEI) as the inactivating agent while formalin has been used at Brescia. In both Institutes, it has been found that the cultivation of BHK 21 cells in deep suspension culture provides a readily available cell substrate which can be stored for long periods, so providing a cell bank. The cells of this bank can be grown up to industrial-scale production level in a sterile system, using relatively small amounts of labour. The vaccines produced with such cultivated virus seem to confer a very satisfactory immunity as shown by the results obtained in potency tests on cattle at Firbright and on guineapigs at Brescia.

Dr. Nardelli also reported on recent experiments at Brescia on the possibility of carcinogenic effects in Syrian hamsters of the inoculation of viable BHK cells, cell-free extracts, formol-treated cells, chloroform-treated cells, inactivated virus cultivated on such cells and inactivated vaccines prepared with these cells. The results were that only viable, intact BHK cells are able to produce tumours in hamsters; no tumour-like reactions were observed following injections of any of the other above-mentioned preparations.

In the discussion of the two papers, Dr. Capstick stated that, in spite of the use of horse serum for virus cultivation, no symptom of anaphylaxis has so far been observed (150,000 doses applied) and that the harvesting of virus for vaccine production is carried out when the rising curve of the complement-fixation power crosses the descending curve of the virus titre (i.e. some time after the peak of infectivity is reached).

Following discussion of problems connected with the use of BHK cells in veterinary medicine, in which references were made to statements in the literature and to the research work recently carried out on the same subject, the following conclusion was reached by the Research Group:-

Considering:

- (a) the ease with which the intense multiplication of BHK 21 cell lines in suspension is now obtained,

- (b) the sensitivity of these cells to FMD virus, which allows the preparation of viral suspensions of higher infective titre and complement-fixing power,
- (c) the immunising value of the antigens obtained,
- (d) the simplicity of the apparatus and its operation,
- (e) the safety in use of vaccines derived from BHK cells for animals, which is supported by the following findings:-
 1. The limitation of carcinogenic activity of the cells to hamsters and the absence of carcinogenic activity in the cells when inoculated into cattle, sheep, pigs, rats, rabbits, guineapigs and mice;
 2. The absence of carcinogenic activity in the hamster when the cells are killed, or when cellular extracts are freed from viable cells;
 3. The innocuity for the hamster and cattle of FMD vaccines treated with betapropiolactone or by formol;

the Group feels that the use of BHK 21 cells is of interest and importance in the preparation of FMD vaccines and considers that this new technique will, in future, supplement the methods which are already available in the laboratory for producing vaccines.

Dr. Lucam reported on the results obtained by him and by his team in cultivating foot-and-mouth disease virus in stationary calf kidney cells. In confirming the favourable results already obtained by other research workers, Dr. Lucam expressed the view that some further information is still needed on certain factors which have a direct bearing on the production of the virus by this method. No difficulties, however, are experienced by his team in cultivating FMD virus by this method. The titre of the virus after 18 to 20 hours' growth in tissue culture reaches the value of 10^7 ID₅₀/ml.

To obtain vaccine with activity corresponding to the minimum required in France for class I vaccine (K index at least 1.2), $10^{7.5}$ ID₅₀ of the virus per vaccinal dose is necessary.

In commenting on these results, Dr. Willems stated that only by agitating the cultures sufficiently, was he able to obtain virus with satisfactory antigenic power as measured by complement-fixation. The technique of "stationary" cellular suspensions has given him less good results.

Replying to Dr. Brooksby, Dr. Lucam pointed out that it is yet too early to recommend the general use of the technique of stationary cell suspensions for the cultivation of virus to be used for vaccine production.

Dr. Girard reported on his research work at Ankara together with his Turkish colleagues on complement-fixation tests applied to Arcton-treated antigen. The purpose of this research was to find a method for determining the antigenic value of a virus culture which would be more reliable than the measurement of the infectivity titre and of the data furnished by the application of complement-fixation to the virus not treated with arcton. A positive result was obtained, and the experimental

vaccines prepared with tissue culture virus containing only saponin as adjuvant, have shown a high antigenic activity which is correlated with the value of the complement-fixation applied to the virus treated with arcton.

2. Epidemiology

Dr. Moosbrugger submitted some peculiar facts which were observed in the course of the last FMD epizootic in Switzerland (October 1965 to April 1966), concerning the recovery of virus types different from those of the epizootic (type O): these seemed to corroborate previous observations of the possibility of mutation of the FMD virus during the course of an epizootic. In order to avoid any misunderstanding in subtype classification, Dr. Moosbrugger stated that O Lausanne, O Brent (Basle) and O Switzerland (Pirbright) are the same sub-types.

Dr. Davie (Pirbright) presented a paper on the current position of sub-type strains, with particular reference to strain A22 and to techniques now applied at Pirbright to determine strain differences. The World Reference Laboratory has demonstrated the affinity, apart from minor differences between the sub-types of the O virus observed since 1962 in Western Europe, the Syrian Arab Republic, Israel, Turkey and USSR.

This has also been done with regard to the sub-types of the A virus and more recently for virus SAT3. The investigation of sera obtained from the field from various parts of the world complemented the epizootiological study of the disease and directed specific prophylaxis increasingly towards the use of homologous vaccines. In comparing field strains of virus, cross-neutralisation tests with strain-specific sera produced in guineapigs and with convalescent cattle sera are valuable in the selection of virus strains for vaccine production.

Dr. Hedger (Pirbright) illustrated the results of field studies on FMD in Bechuanaland where a survey was carried out to determine the immune status of the livestock population in three distinct areas. In particular, the degree of heterotypic response to vaccination was evaluated in places where the animals had previously had experience through infection or vaccination with virus types SAT1 and/or SAT3. The results obtained suggest that heterotypic reactions may occur with both strains of virus. Moreover, it has been shown that the method of using vaccines on sample groups is of particular value in assessing the probable results of prophylactic vaccination of whole populations in different ecological areas.

In the discussion, Dr. Hedger was asked whether he had noted differences between the various age groups and the reply was that the system of breeding as practised in Bechuanaland and the retarded sexual maturity of Bos indicus does not permit the establishment of a correlation with European cattle for age groups under three years.

Dr. Burrows (Pirbright) reported on a series of very interesting observations made on the carrier state following exposure to FMD virus.

Using the apparatus devised by Dr. van Bekkum for the collection of samples from the oesophageal-pharyngeal region of cattle infected by tongue inoculation and which had shown severe generalisation, Dr. Burrows succeeded in recovering type A virus (A 119) from 1 of 10 cattle, fifteen months after infection and from 2 of 4 cattle fourteen months after infection (A Turkey). Other types of virus have not shown such a long

persistence. The virulence and antigenic characteristics of virus isolated from such carrier animals were also studied. In the type A strains, the recovered virus was shown to have some reduction in infectivity for cattle tongue, but no reduction in the severity of secondary lesions was noted: other types appeared to be fully virulent. There were indications of distinct antigenic variation in the A 119 strain in one animal, between 14 and 17 weeks after infection with the recovered virus. In a preliminary study, the persistence of modified virus was investigated in animals used for innocuity and immunogenicity tests of modified vaccine strains. The result was that only a small percentage of cattle developed a carrier state after intramuscular injection of modified virus, and that up to 50 percent of cattle exposed to infection of the pharyngeal area by tongue inoculation or by spray of some strains became carriers of the modified virus. Sheep were also exposed to virulent virus strains and the results showed that the majority of these animals were no longer carrying virus four months after infection. The persistence of virulent virus strains in 56 pigs could not be shown for a longer period than 10 days after infection. (four strains of virus were used).

In discussing this paper, Dr. Burrows added that the first recovery of the virus was on tissue culture (BHK cells), that the pigs had been exposed to infection by contact, that mice had been used for the recovery of modified virus and that all virus carriers had serum-antibodies. In this connection, Dr. Brooksby recalled the results of research work carried out by Dr. Henderson in which calves born from mothers vaccinated with live modified vaccine had shown persistence of the virus, although antibodies could not be demonstrated.

Dr. Lucam described the results of a comparative study of the variants O Flanders (1947) and O Lausanne (1965) with statistical interpretation of the values obtained in cross-protection experiments. The practical result of his findings was that a certain number of vaccines prepared with strain O Flanders alone and whose activity against this strain was equal to or a little greater than the minimum activity ($K=1.2$), required by the French regulations, would have conferred insufficient protection against strain O Lausanne. In discussing this point, certain delegates voiced the view that the interpretation of the K index may not be applicable to all variants of a given virus type.

4. Structure of Foot-and-Mouth Disease Virus

The Report of Dr. Brown (Pirbright) on this topic consisted of a review of the current knowledge of the structure of FMD virus.

A report was presented by Dr. Cowan (Plum Island) who, together with Dr. Graves, has demonstrated the existence of a new antigenic component (referred to as VIA or "virus infection-associated antigen") in fluids from tissues infected with FMD virus which does not appear to be an integral component of the virus. It is assumed that it might be a component involved in virus synthesis.

Discussion and demonstrations on virus structure took place in Dr. Brown's laboratory.

5. Immunisation of pigs

The report of Dr. van Bekkum (the Netherlands) dealt in some detail with results of the vaccination campaigns in pigs carried out during the last severe epizootic in the Netherlands (October 1965 to Spring 1966),

caused by virus type C. In a first campaign (Municipality of Deurne), 56,000 pigs were vaccinated in the course of a single week (9-17 November) and the last case of the disease was reported on 24 November (in the meantime 26 farms had become infected). In a second campaign, 14,300 swine were vaccinated in a single day (village of Schayk) and, after 11 days, no further outbreak had been observed. In the other zones exposed to the disease, single or double vaccination (15 days interval) was employed, with results that were not easy to interpret but, in general, were quite favourable. Concentrated and normal vaccines (cattle dose) were used and, in the laboratory, the concentrated vaccine proved definitely to be more potent. In general, up to 10 days after the use of each of the vaccines in the field, cases of the disease continued to occur. The speed with which these vaccinations were carried out in the field and the percentage of susceptible pigs submitted to vaccination were undoubtedly also important factors in determining the success which would have been difficult to obtain without proper, prompt and coordinated action.

The second report on this project was presented by Dr. McKercher and was the result of experiments conducted with Dr. Giordano at Plum Island for the purpose of obtaining more information on the response of swine inoculated with virulent FMD virus, with chemically treated FMD virus combined with oil adjuvant, and with chemically treated FMD virus and aluminium hydroxide gel adjuvant. The main observations made during these experiments were : 1. Swine recovered from experimental infection with FMD virus were susceptible under certain conditions to contact exposure with a homologous virus. 2. Sera of swine inoculated with chemically treated glycidaldehyde (GDA) or acethylethyleneimine (AEI) FMD virus combined with an oil adjuvant had an enduring level of antibody, and were resistant to challenge by exposure to FMD-infected swine for at least 90 days. 3. The antibody level was significantly higher in the animals inoculated with the treated virus and oil adjuvant than in the animals inoculated with the treated virus and aluminium hydroxide adjuvant.

The third report on this item was presented by Dr. Burrows (Pirbright) on the results of experiments carried out at Pirbright, using FMD vaccines inactivated by treatment with acethylethyleneimine (AEI). This report confirms the difficulty of obtaining an immunity response in swine of such a level that they will withstand challenge by artificial inoculation of the virus. However, a good correlation was shown to exist between antibody titre and the response to challenge (heel inoculation). The 50% immunity level is approximately 1.5, a similar figure to that found for cattle challenged by tongue inoculation.

Dr. Lucam's report, fourth of the series, consisted of two parts. The first part was a bibliographical review of materials and methods applied in the vaccination of swine. The conclusion was that it is impossible to support vaccination on the basis of the figures and opinions found in the literature consulted. The second part dealt with an experiment carried out at Lyons in an attempt to determine the 50% protective dose (PD 50) in swine against the appearance of secondary lesions following inoculation of virulent test virus. The interpretation of the results obtained, led Dr. Lucam to conclude that it would be an illusion to hope for efficient immunisation of pigs with the vaccines now at our disposal.

The discussions on the vaccination of pigs consisted mainly of remarks opposing the somewhat pessimistic conclusions drawn by Dr. Lucam from bibliographical and laboratory investigations. The views of Professor Ubertini (Brescia) were:

1. The fact that the vaccination of pigs has given better results in the field than in the laboratory is not at all paradoxical, when less severe conditions of challenge in the field are considered. 2. In Italy, the vaccination of large piggeries composed of separated units had been efficient in stopping the disease even within the piggery itself, if carried out in time. 3. Double vaccination (at one month's interval) ensures a very good protection even against severe challenge. 4. When challenging under laboratory conditions, the infection should be transmitted by contact, using the same strain of virus as that with which the vaccine was prepared.

Dr. Leunen (Brussels) contributed to the discussion by giving an analysis of the laboratory and field results obtained in Belgium, mainly on the occasion of the last epizootic (C virus).

He was able to obtain 90-100% resistance in the laboratory and almost 100% resistance in the field in pigs by the use of a cattle dose of Belgian vaccine (in this case produced with a virus of porcine origin). The potency of the vaccine is tested on pigs by the injection of 1,000 ID₅₀ in the coronary band and the protection is still very satisfactory after 12 weeks.

Extensive field campaigns carried out during winter 1965 to 1966 in two different areas of the country by the application of two different methods clearly demonstrated that very good results can be expected from the compulsory and prompt vaccination of all pigs exposed to possible contamination. Vaccine must be injected subcutaneously and better results follow injections made in the leg. Dr. van Bekkum supported this view by emphasising the reasons why better vaccination results can be obtained in the field rather than in the laboratory. He indicated the fruitful experience gained in recent years in the State Laboratories by the extensive use of vaccination of pigs.

Dr. Moosbrugger concluded that the danger of contamination, facilitated by the steadily increasing traffic of animals and the results so far achieved in the field, make the vaccination of pigs indispensable each time an epizootic appears in swine. He gave examples of the stopping of outbreaks following the vaccination of pigs in an infected area.

6. Immunization of sheep

The report of Dr. Fontaine (IFPA) on FMD vaccination of sheep summarised a series of experiences which were referred by the European Commission to the Research Group in order to establish the dosage of vaccine for this species.

From the control of viraemia, it has been possible to establish the PD 50 of the vaccine at different intervals after vaccination. The conclusion is that 1/3rd or 1/4th of the cattle dose usually employed confers a solid immunity in sheep for at least 5 or 6 months after the first vaccination. It is important to note that the degree of response, of sheep to vaccination, measured at different intervals after vaccination, does not follow the same pattern as that observed in cattle (the PD 50 is 1/20th of the cattle dose 20 days after vaccination and 1/13th after 28 days).

In the discussion, Dr. Fontaine stated that he had never observed generalisation without viraemia, but viraemia may be transient in sheep.

Dr. Girard explained his method of testing vaccine in sheep; it is a modification of Henderson's technique applied to the tongue of sheep (four points of inoculation per dilution) and seems to permit an easy calculation of PD 50 by direct tongue readings.

LABORATORY VISITS

Tissue Culture

A demonstration was mounted on the construction of stainless steel vessels for suspended cell cultures. The production of cells involved a cascade system of vessels beginning at 1 litre and progressing to 5, 30 and 100 litres. Cells can be moved from one to the other through stainless steel piping so that a closed stirring system can be maintained. The techniques for infection of the cells were described. It had been found useful to sediment the cells and change the medium overnight before infection.

The problem of sterilization of effluent air has been dealt with by the use of muffle furnaces controlled at 350° C.

Vaccines produced from virus prepared in this way have given results as good as or better than comparable Frenkel vaccines from the same strains of virus.

Vaccine Department

The Silverson apparatus for the preparation of tissue suspensions was demonstrated. This enables emulsification of tissues to be carried out in a completely closed vessel with a special seal to prevent escape of infective aerosol. Techniques for handling mice in sealed hoods were also demonstrated. Using such hoods, a number of different strains of virus can be handled in the same laboratory with a minimum of cross-infection; in a room of approximately 30 x 10 feet, 18 different strains can be handled. The apparatus described by Fagg in 1965 for the study of inactivation of virus was also demonstrated.

Arboviruses

The growth of Senliki Forest Virus in BHK cells varies according to the clone of virus used. Original virus seed produces an interfering component which prevents high titres being obtained. By selection of clones, it is possible regularly to prepare suspensions of high titres without the interfering component.

Epidemiology

The current procedure for typing and sub-typing of virus was demonstrated. A micro-test is now being developed and is giving successful results. Bovine thyroid cell cultures as described by Snowden are being used for the recovery of virus from field specimens; they allow a higher rate of success in the screening of regional specimens from overseas. In comparative titrations, these cultures are from four to several hundred times more sensitive than other BHK cultures, mice or cattle tongue inoculations.

Details were given of a case of foot-and-mouth disease in a farm-worker in Northumberland.

African Swine Fever

The complement fixation test has been applied to the detection of viral antigen in the spleen and lymph nodes of pigs after infection with ASF. Good fixation has been obtained and, with improvements in techniques of removal of non-specific effects, the method can be applied in the diagnosis of the disease.

Biochemistry

The techniques currently being used in the study of biochemistry of virus were demonstrated. These include sucrose gradient centrifugation and studies of RNA synthesis, using radioactive tracers.

Pathology

Some of the factors influencing the generalization of foot-and-mouth disease were discussed.

MEETING OF THE RESEARCH GROUP

Members of the Research Group (Dr. J.B. Brooksby, Prof. R. Willems, Prof. B. Ubertini, Dr. J.G. van Bekkum and Dr. E. Michelsen) took part in the Meeting.

The activities of the Research Group were reviewed and satisfaction was expressed regarding the amount of work accomplished in recent years in collaboration with research workers invited from other laboratories.

It was generally agreed that the Group should concentrate in future on laboratory visits and discussions conforming with the activities carried out by the Group at the beginning of its establishment.

The request made by the Danish delegation at the 13th Session of the Commission concerning improved international exchange of information on disease incidence and typing results was examined and discussed. Dr. Brooksby emphasized that the World Reference Laboratory was doing its best in distributing information on types and subtypes demonstrated in samples received from developing countries or laboratories. European Laboratories are able to carry out routine typing very satisfactorily and the World Reference Laboratory is prepared to assist any time particular problems arise. The need, therefore, is more a matter of improving the reporting and the exchange of information between laboratories (and veterinary services). The Group will continue to work on this problem.

In accepting the formal invitation sent by the Director of the Plum Island Institute to the Research Group, it was decided to hold the next Meeting at Plum Island in September 1967. The definite Agenda of the Meeting will be established in consultation with Dr. Callis.

The work carried out in the various sections of this Institute of FMI should be the main subject for discussion and for an exchange of views between American and European research workers.

MEETING OF THE EXECUTIVE COMMITTEE

APPENDIX IVb

HELD IN DUBROVNIK, YUGOSLAVIA

12 - 14 October 1966

SUMMARY

1. The following members of the Executive Committee were present at this meeting:- Dr. R.P. Gaier - Austria (Chairman), Prof. A. Ademollo - Italy (Vice-Chairman), together with Dr. Scherli, Mr. J. Reid - United Kingdom (Vice-Chairman), Dr. Chr. Werdelin - Denmark, Dr. J.M. van den Born - Netherlands and Dr. S. Mihajlović - Yugoslavia; Dr. E.A. Eichhorn, Chief, Animal Health Branch, FAO and Dr. G.M. Boldrini and Miss D. Guarino of the Secretariat also attended.

2. The Present Position of Foot-and-Mouth Disease (October 1966) in Europe

The following are summaries of the reports on the position in different countries, given at the meeting:-

Yugoslavia

The disease caused by virus type O occurred on 12 farms during the first half of 1966, the last being on 1 June, since when the country has been free. Stamping-out and the application of strict sanitary measures was carried out as usual.

Italy

The overall position is showing very definite improvement, due to decrease in the incidence in the North of the country where compulsory vaccination is enforced in large areas. Here, only 11.4 percent of the outbreaks throughout the country were recorded in 1966, against 81.76 percent in 1964. It is planned to extend vaccination to all the cattle population in Italy in 1967. Virus typed from 206 outbreaks during the first 7 months of 1966 showed type A in 15.53 percent, type O in 73.30 percent and type C in 11.17 percent. Imported ruminants are required to have undergone trivalent vaccination in their country of origin or, failing this, on their arrival at their destination in Italy.

The Netherlands

In the highly virulent 1965-66 epizootic, caused by virus type C, mostly swine, but also cattle were involved. Following the beginning of the epizootic at Limburg and despite the application of severe sanitary measures, strict control of movement of animals and destruction of animals under governmental auspices and the vaccination of pigs with concentrated vaccine, the disease spread to a considerable extent. A new control method was introduced consisting in the designation of areas by the Director of Veterinary Services for voluntary vaccination of pigs with normal or concentrated cattle vaccine at Government expense. Because of the demand for this vaccination, it was necessary to import some of the vaccine used. The epizootic reached its peak in mid-January and then declined fairly rapidly and in May the country again became free. In all, 243,000 pigs and 3,496 cattle were destroyed, 10,000,000 dollars being paid in compensation. Banning of exports by European countries is estimated to have caused a loss of about 10,000,000 dollars to the Netherlands.

A closer collaboration between the Veterinary Services of different countries, in connection with the banning of imports from countries infected with foot-and-mouth disease, was emphasized during this part of the discussion. It was also suggested that Article IX of the EEC Regulations should be the subject of revision.

Denmark

There were 23 outbreaks in cattle and pigs between 21 February and 23 May, caused by virus type O (O Lausanne) in Denmark after a long period of freedom. The type O₂ vaccine as produced in Denmark did not protect against this virus strain and imported vaccine was used for ring vaccination. In all, 900 cattle and 2,806 pigs and some small ruminants were destroyed, a total of 2,400,000 Danish Kroners being paid in compensation. There were no further outbreaks.

United Kingdom

After a long period of freedom, the disease appeared in cattle and sheep in July in the county of Northumberland and continued in the area, with a total of 32 outbreaks each caused by virus type O, until early September. In all, 5,500 cattle, 16,000 sheep and 500 pigs were destroyed, with about £1,000,000 paid in compensation. This occurrence gave rise to some difficulties from an economic point of view, because of restrictions applied to the movement of animals in this sheep breeding and cattle fattening area.

More recently there was an outbreak in the county of Sussex with a further outbreak from direct contact, caused by virus type A, the origin of which was not established.

Austria

There has been only one outbreak, viz. in March 1966, the infection being introduced from Bavaria, since the last session of the Commission. Vaccination in Austria is confined to cattle, 400,000 cattle having been vaccinated in 1966 up to the time of this meeting.

Switzerland

There were no outbreaks after June 1966 when a successful vaccination campaign had been completed.

German Federal Republic

There was a serious epizootic at the end of 1965 and the beginning of 1966: the incidence has gradually decreased. Control of the disease throughout the country is now coordinated by the Federal Veterinary Services at Bonn.

Hungary

There would seem to be some disease in the country.

Greece

A single outbreak near the Turkish border in Thrace, caused by virus type A₂₂ occurred in June probably following the smuggling of animals from Edirne province. There have been no further outbreaks.

Bulgaria

A few outbreaks, attributed to trial of a locally produced type A₅ vaccine occurred in a village near the buffer zone in Bulgarian Thrace.

Cyprus

Cyprus has been free for two years. All the susceptible animals including pigs have been vaccinated against virus type A₂₂.

3. The Position in South-Eastern Europe and the Near-East.

The Secretary reported on the campaigns against the disease. Vaccination against virus type SAT₁ and the autumn campaign against virus type A₂₂ will not be carried out in south-east Europe, all the remaining financial resources being required for the re-establishment of the buffer zones in spring 1967, because Turkey will not be able to produce sufficient vaccine before the end of 1967.

It was intimated that a further meeting, as decided at the meeting of the FAO/BEC/OIE Consultative Committee in Brussels in September, will be held in spring 1967, before a decision is made on financing the campaigns.

The value of the work of the Commission in the campaigns whereby the spread of the various epizootics into Europe was prevented was commented on during the discussion.

4. Surveys by the Secretariat - Future Activities of the Commission.

The Secretary gave an account of his trips, together with the Chairman of the Commission, to Bulgaria and Ethiopia for the purpose of evaluating the potential hazards concerned with the importation of meat from Ethiopia to Bulgaria. It was felt by some delegates that, despite the good organization and precautions, this importation cannot be considered entirely safe. The risks could be avoided if the meat could be sufficiently cooked before shipment.

The Secretary also reported on the meeting of the Research Group of the Commission at Pirbright in September (see attachment). It was pointed out that very helpful contributions had been made by workers from non-member countries of the Commission. The Meeting of the Research Group in 1967 is intended to be held at Plum Island (U.S.A.)

A report was made on the meeting in Beirut in September when problems on traffic in animals and meat in the Near-East region was considered.

5. Revision of Scale of Contributions

The meeting felt that, because the contributions have not been increased for 12 years, it should be proposed at the next session of the Commission that there should be a 20-25 per cent increase in the contributions now in force.

APPENDIX V

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

BUDGETS FOR 1967 AND 1968

(Note by the Director-General of FAO)

1968 Administrative Budget

1. In accordance with the Constitution of the Commission and with its Financial Regulation III, I present herewith the proposed Annual Administrative Budget for 1968.
2. The budget estimates have been drawn up in the form established in the Financial Regulations.
3. At this stage I have no "Supplementary details" with respect to Chapter II but I am presenting the estimates here in a single total in accordance with Financial Regulation 3.2. No expenditures have so far been made under this Chapter and in the absence of any experience to guide me I recommend that an arbitrary sum of \$2,000 be provided here for 1968; equal to the amount included in the approved 1967 budget.
4. It will be noted that the proposed Annual Administrative Budget for 1968 totals \$48,500, i.e. the maximum potential contributions from Member Governments that may be received by the Commission. I realise, of course, that the Commission may not actually receive the full amount of \$48,500 (at the time of preparation of this budget it is possible to count on only \$32,500); in that event, expenditures would be restricted in order to keep total expenditures within the limits of the funds actually received.
5. Under Article I "Personal Services" of Chapter I, the budget estimates allow, as in 1967, for one P-4 Secretary to the Commission and one G-5 Administrative clerk. The slight increase in salaries as against 1967 is due to increments. The budget estimates for 1968 also allow, as in 1967, for the services of a Consultant. The articles "Travel" and "Meetings of the Commission", have been decreased in order to allot to Chapter II the maximum amount possible.

1968 Special Budget

6. In the Special Budget for the Special Account, 1968, I recommend that an amount of \$5,000 be provided to cover any necessary travel and per diem of members of the Standing Technical Committee.

Revisions to 1967 Administrative Budget

7. The total increase of \$300 under Chapter I is to cover expected increases in the Rome General Service salary scale and is offset by a corresponding reduction of \$300 in Travel.

The Special Budget for the Special Account is increased by \$1,000 to cover higher costs of travel and per diem of members of the Standing Technical Committee.

8. I attach at Table A the revised Annual Administrative Budget for 1967, together with my proposed budget estimates for 1968; at Table B a Summary showing by Article the provisional expenditure in 1966, the 1967 revised budget and the 1968 proposed budget and at Table C a note giving the Special Budget for the Special Account for 1968.

Assistance given by FAO

9. Besides the above expenditure there are items which have not been included which are provided by the Organization. These items not charged to the Commission include part-time services of senior officials of the Organization, the services of the Budget and Finance units, accomodation, equipment, supplies of stationery, etc. as well as postal and cable charges.

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

ANNUAL ADMINISTRATIVE BUDGET FOR 1968

TABLE A

<u>Source:</u>	Members of the Commission	<u>Application of Resources</u>	
<u>Amount:</u>	Possible Contributions in respect of 1968	<u>Chapter I</u> Administrative Expenditure under Articles IV and XII.2 of the Constitution	\$26,900
	\$48,500		
		<u>1. Personal Services</u>	
		i) Salaries, Established Posts	\$19,700
		ii) Common Staff Costs	\$ 4,000
		iii) Consultants	\$ 3,200
		<u>2. Travel</u>	\$ 1,000
		<u>3. Meetings of the Commission</u>	\$ 1,300
		<u>4. Contractual Services</u>	\$ 800
		<u>5. Miscellaneous</u>	\$ 500
		Sub-Total Chapter I	\$30,500
		<u>Chapter II</u> Expenditure under Article V of the Constitution	\$ 2,000
		Sub-Total Chapter II	\$ 2,000
		<u>Chapter III</u> Contingencies	\$16,000
		Sub-Total Chapter III.	\$16,000
		<u>GRAND TOTAL</u>	<u>\$48,500</u>

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EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

ANNUAL ADMINISTRATIVE BUDGET FOR 1967 (Revised)

TABLE A

<u>Source:</u>	<u>Members of the Commission</u>	<u>Application of Resources</u>
<u>Amount:</u>	(a) Contributions due in respect of 1967 \$32,500 (b) Possible additional contributions \$16,000	<u>Chapter I</u> Administrative Expenditure under Articles IV and XII.2 of the Constitution 1. <u>Personal Services</u> i) Salaries, Established Posts \$19,300 ii) Common Staff Costs \$ 4,000 iii) Consultants \$ 3,200 2. <u>Travel</u> \$ 1,200 3. <u>Meetings of the Commission</u> \$ 1,500 4. <u>Contractual Services</u> \$ 800 5. <u>Miscellaneous</u> \$ 500 Sub-Total Chapter I \$30,500 <u>Chapter II</u> Expenditure under Article V of the Constitution \$ 2,000 Sub-Total Chapter II \$ 2,000 <u>Chapter III</u> Contingencies \$16,000 Sub-Total Chapter III \$16,000 <u>GRAND TOTAL</u> \$48,500

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

SUMMARY OF THE BUDGETS FOR 1966, 1967 AND 1968

TABLE B

	<u>1966</u> <u>Expenditure</u> \$	<u>1967</u> <u>Revised</u> <u>Budget</u> \$	<u>1968</u> <u>Budget</u> \$
TOTAL	27,170.93	48,500	48,500
<u>CHAPTER I</u>			
1. Personal Services	22,459.22	26,500	26,900
1.1 Salaries, Established Posts	(19,414.22)	(19,300)	(19,700)
1.2 Common Staff Costs	()	(4,000)	(4,000)
1.3 Consultants	(3,045.00)	(3,200)	(3,200)
2. Travel	825.01	1,200	1,000
3. Meetings of the Commission	(864.98)	1,500	1,300
4. Contractual Services	(1,026.14)	800	800
5. Miscellaneous	(442.45)	500	500
Sub-Total Chapter I	25,617.80	30,500	30,500
<u>CHAPTER II</u>	-	2,000	2,000
<u>CHAPTER III</u>	-	16,000	16,000

SPECIAL BUDGET FOR SPECIAL ACCOUNT

TABLE C

Travel and per diem of members of the Standing Technical Committee	1,553.13	5,000	5,000
GRAND TOTAL	27,170.93	53,500	53,500

STATEMENT I

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT AND MOUTH DISEASE

Accounts for the twelve months ended 31 December 1966

<u>Administration</u>	\$	\$
Personal Services	22,459.22	
Travel	825.01	
Meetings of the Commission	864.98	
Miscellaneous (including Contractual Services)	1,468.59	
	<u>25,617.80</u>	
Balance transferred to the Special Account	7,632.20	
	<u>33,250.00</u>	
		<u>33,250.00</u>

STATEMENT II

SPECIAL ACCOUNT

	\$	\$
Travel and per diem costs of members of Technical Committee	1,553.13	Balance 1 January 1966
Balance at 31 December 1966	28,023.79	Transferred from General Account
		Savings on previous years unliquidated obligations
		Refund previous years expenditures
	<u>29,576.92</u>	<u>29,576.92</u>

APPENDIX VI

STATEMENT III

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT AND MOUTH DISEASE

Accounts for the year ended 31 December 1966

Balance Sheet at 31 December 1966

<u>Liabilities</u>	\$	<u>Assets</u>	\$
Special Account	28,023.79	Current account with the Organization	28,023.79
	<u>28,023.79</u>		<u>28,023.79</u>
	<u>28,023.79</u>		<u>28,023.79</u>

SCHEDULE I

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT AND MOUTH DISEASE

Statement of Contributions due in 1966
(Expressed in US dollars)

<u>Country</u>	<u>Amounts Due</u>		<u>Amounts Received</u>	<u>Amounts Outstanding at 31.12.1966</u>
	<u>Outstanding at 31.12.65.</u>	<u>In respect of 1966</u>		
Austria	-	1,500	1,500	-
Belgium	-	2,500	2,500	-
Denmark	-	2,500	2,500	-
Greece	-	750	750	-
Iceland	-	250	250	-
Ireland	-	750	750	-
Italy	-	5,000	5,000	-
Luxembourg	-	250	250	-
Netherlands	-	2,500	2,500	-
Norway	-	750	750	-
Portugal	750	750	1,500	-
Sweden	-	2,500	2,500	-
Switzerland	-	2,500	2,500	-
Turkey	-	1,500	1,500	-
United Kingdom	-	7,000	7,000 ^{1/}	-
Yugoslavia	-	1,500	1,500	-
	<u>750</u>	<u>32,500</u>	<u>33,250</u>	<u>-</u>

^{1/} Received in 1965 for 1966.

APPENDIX VIA

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT-AND-MOUTH DISEASE

CHAPTER I

Administrative Expenditure for
the Twelve months ended
31 December 1966

	Approved Budget \$	Expenditure \$	Outstanding Obligations \$	Total Obligations \$	Available Balance \$
Personal Services	26,600.00	22,459.22	-	22,459.22	4,140.78
Salaries and allowances Consultants		(19,414.22) (3,045.00)			
Travel	2,450.00	825.01	-	825.01	1,624.99
Meetings of the Commission		(864.98)	-		
Contractual Services	1,450.00	(1,026.14)		2,333.57	883.57 DR
Miscellaneous		(442.45)	-		-

Total Chapter I

30,500.00 25,617.80 - 25,617.80 4,882.20

CHAPTER II

Expenditure under Article V
of the Constitution

Total Chapter II 2,000.00 - - 2,000.00

CHAPTER III

Contingencies

Total Chapter III 16,000.00 - - 16,000.00

Total Chapters I, II and III 48,500.00 25,617.80 - 25,617.80 22,882.20

Approved Budget	Expenditure	Outstanding Obligations	Total Obligations	Available Balance
\$	\$	\$	\$	\$
4,000.00	1,553.13	-	1,553.13	2,446.87
52,500.00	27,170.93	-	27,170.93	25,329.07

Special Budget for the Special Account

Travel and per diem of members of the Standing Technical Committee

GRAND TOTAL

APPENDIX VIb

EUROPEAN COMMISSION FOR THE CONTROL OF FOOT AND MOUTH DISEASE

Schedule of unliquidated obligations (Sundry Creditors)

as at 31 December 1966

Amount Outstanding

NIL

APPENDIX VII

INCREASE IN CONTRIBUTIONS

The administration of the European Commission for the Control of Foot-and-Mouth Disease is effected by Trust Fund 42, set up by the contributions of member countries on the basis of a scale established in 1954 and which has remained unchanged until now. These funds were provided to ensure the carrying out of the normal functions of the Commission as foreseen, in particular, by article IV of the Constitution (General Functions).

Any savings made at the end of each financial year are transferred to the Special Account of the Commission; they made it possible to cover four times the situation as foreseen in article V of the Constitution, in which 'special functions' of the Commission are considered. 'Special functions' of the Commission may consist of assisting member countries in controlling outbreaks in emergency situations, promoting the establishment of 'cordons sanitaires', distributing vaccines in case of need, and carrying out such further special projects as may be suggested by Members for achieving the purpose as set forth in the Constitution. Besides the allotment of two stocks of vaccine, the Commission participated with its funds to the amount of US\$12,000 in the first action taken by FAO in 1962 against the SAT₁ infection in Turkey and, more recently, funds were set aside for the purchase of a limited stock of A₂₂ vaccine to be used if the virus should spread beyond the buffer zone.

The possibility of transferring the balance of the General Account to the Special Account would no longer have been possible during the last 4 years, if the Secretary's missions in south-eastern Europe (Greece and Turkey) had been charged to TF 42 instead of the Trust Funds of the SAT₁ campaign. The latter funds however will soon be exhausted.

It was felt, that in order to balance again the accounts of the Commission, an adequate adjustment of the resources should be made. If not, keeping article V in the Constitution referring to 'Special Functions' would lose its significance and, consequently, every possibility (even though limited) of an intervention by the Commission in case of emergency would be precluded in future.

The possibility of making an opportune adjustment was already considered by the Executive Committee in Milan (1 February 1966) and in

Dubrovnik (12-14 October 1966) and it was accepted unanimously that an increase of 20-25 percent of the present annual contributions would solve all problems.

The Chairman has already informed the Commission at the XIIIth Session of the fact that favourable consideration to this problem was given by the Executive Committee in Milan.

With regard to the procedure that should be adopted in view of the increase in the regular contribution, the Legal Council of FAO, consulted by the Secretary on this matter, has pointed out the following:

- (a) The scale of contributions appearing in Appendix I of the Commission's Constitution was mandatory only during the first five years after the Constitution came into force (Article XIII, paragraph 1).
- (b) No amendment would be required in the event that the XIVth Session of this Commission should decide to modify the scale of contributions providing that it is adopted by two-thirds majority of the membership of the Commission.