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CONSEIL PERMANENT INTERNATIONAL POUR L'EXPLORATION
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International Conference on the North Sea Plaice Fisheries,
held at Amsterdam, 24th to 28th March, 1925, of Official
Delegates from the Countries bordering on the North Sea.

Resolutions adopted at the meeting held on 28th March, 1925,

with

Reservation made by the French and Belgian Experts.

I.

The Conference fully supports the proposals made by the Plaice Committee in 1921 (published in Rapp. & Pr. Verb. Vol. XXVII pp. 50 to 53) and adopted by the International Council, but in the event of it proving impracticable to secure the acceptance of these proposals as far as they relate to closure, by the Governments concerned, it would be prepared to recommend the modification suggested by the German Experts, namely that the Inner Zone should be closed only from March to October and the Outer Zone only from July to October.

II.

The Conference is of the opinion that it is desirable that in the countries bordering the zones proposed for closure a size limit of at least 20—22 cms. should be introduced.

III.

The Conference in considering these proposals has given full weight to the difficulty of putting them into practice, and realises the importance of securing the goodwill of the fishermen concerned. It trusts that the fishermen may be convinced of their utility and will therefore be prepared to support them.

Reservation.

Les experts de France et de Belgique estiment en outre qu'il serait préférable, au point de vue scientifique, que la fermeture des secteurs indiqués soit complète, et applicable même aux navires à voiles ou à moteurs de faible puissance, mais, tenant compte de la nécessité de permettre aux pêcheurs appartenant aux nations qui bordent les secteurs fermés, d'exercer leur industrie, se bornent à demander que pendant la période de fermeture de ces secteurs, une restriction soit apportée à la pêche de ces petits navires sous forme d'une réglementation tendant à limiter leur champ d'action à une zone aussi restreinte que possible.

(in English) The French and Belgian Experts consider that it would be better from the scientific point of view that the closure of the above mentioned areas should be complete, being extended to apply to sailing and small motor vessels; but, recognising the necessity of allowing the fishermen of the countries bordering on closed areas to continue to fish, they would only request that, during the periods of closure, fishing by these small vessels should be confined by special regulation within as restricted an area as possible.

Procès-Verbal of the Discussions on 24th and 25th March.

Present: Mr. H. G. MAURICE, C.B. (in the Chair).

Delegates:

Belgium: Prof. G. GILSON,
M. A. HAMMAN.

Denmark: Dr. A. C. JOHANSEN,
Mr. F. V. MORTENSEN.

England: Mr. J. O. BORLEY, O.B.E.
& Scotland: Dr. A. BOWMAN,

Mr. T. EDSEER,
Mr. D. T. JONES, C.B.E.

France: Dr. ED. LE DANOIS.

Germany: Prof. E. EHRENBAUM,
Prof. W. MIELCK.

Holland: M. JANSSENS,
Dr. H. C. REDEKE,
Dr. N. TESCH,

M. DE VRIES (representative of the trawl fishing
industry).

Norway: Dr. PAUL BJERKAN,
Prof. JOHAN HJORT.

Sweden: Dr. K. A. ANDERSSON.

Others present were:

Commandeur C. F. DRECHSEL (Secrétaire Général du Conseil International),

Prof. D'ARCY W. THOMPSON, C.B., F.R.S.,

Miss D. E. THURSBY-PELHAM.

The following recent papers were in the hands of the Conference:

- 1) "Report on the English Plaice Investigations in the North Sea during the years 1921—23" by J. O. BORLEY, O.B.E., M.A. & D. E. THURSBY-PELHAM.
- 2) "Schongebiete für die Scholle in der Nordsee" by FR. HEINCKE and W. MIELCK (Incorporating results of German scientific Investigations up to the year 1924).
- 3) Questionnaire circulated by Mr. MAURICE.

The President welcomed the members of the Conference, and after a few introductory remarks called upon the experts of the different countries for an account of the plaice investigations which had been carried out in the last few years.

Mr. BORLEY said that subsequent to the investigations described in the last English Plaice report, the statistical and ichthyometric work had been continued, and a programme of sea work for the year drawn up which included age determinations and measurements of fish taken by the research vessel in the areas where closure was recommended. Work had also been carried out in connection with the questionnaire circulated by Mr. MAURICE.

Prof. MIELCK gave a full résumé of the German report, and in addition communicated with all reservations a rough estimate of the benefits likely to accrue from the proposed closure of areas. He stated that in his country the principle of the closure of areas with the view to secure an improvement of the plaice fisheries was viewed with considerable sympathy by the fishing industry.

Dr. JOHANSEN illustrated by means of graphs the decrease in the yield of plaice fisheries in the Kattegat and Skagerak in the period 1895—1923 and in the North Sea in the period 1903—1913 and again in post-war years. He pointed out that in the Kattegat and Skagerak there had been no decrease in the sizes of the plaice landed while in the North Sea such a decrease was observed in the two periods mentioned. He was of the opinion that the Danish and Swedish size limits in the Kattegat and Skagerak would account for the more favourable conditions in this respect in these waters.

Dr. REDEKE stated that he had found a decline in the catch per voyage of the larger categories of plaice by Dutch steam trawlers during the years 1919 to 1923 which resembled closely that found by the English investigators in the case of English steam trawlers. The total catch, although showing an increase during the first three years due to the larger amount of small plaice taken, also

showed a continuous decrease since 1921. This decline had led the Dutch fishing industry to realize the necessity of remedial measures, and indeed to the expression of the opinion by many practical fishermen that immediate action is now imperative.

The proposals of the Plaice Committee had been discussed with interested parties in Holland and met with a large measure of sympathy.

Prof. GILSON regretted that at present the Belgian statistics were not in a satisfactory condition. He stated, however, that while at present Plaice had lost in importance in the Belgian fishery it was probable that with the introduction of motor vessels now in progress the plaice fishing would increase in importance in future. The interest of the industry in remedial measures would increase with the growth of their fishing power, and he considered that they would welcome such measures if experimental and controlled.

Dr. ANDERSSON said that it was desirable that after so many years of work which had led to definite and unanimous conclusions the proposals of the Plaice Committee should be put into effect.

Prof. HJORT expressed the view that in all research a point is reached at which experiment becomes necessary. He had read both the English and the German reports and these had confirmed his own view that an experiment is now the only method of proceeding further with the Plaice problem.

Mr. MAURICE thought that in spite of doubts which had been expressed as to the value of his questionnaire it was desirable that the Conference should discuss the problem on the definite lines laid down therein. This was not intended as a criticism of the Council's work but was a demand for argument which could be put before the fishing industry. The main reason for asking these questions was that they had been put to him. It was essential for the acceptance of the proposals by the English fishing industry and others that some answers could be given.

The Conference then proceeded to discuss the first question of the questionnaire.

- 1) Assuming that it were possible effectively to close the areas in question to trawling by steam vessels and high-powered motor-boats, what net increase in the total quantity and value of the landings of plaice and other fish from the North Sea might be expected to accrue, and in what period?

Mr. BORLEY said that the effect of closure in one year would persist over a term of years, and it had not proved practicable in the time available to forecast the effects over the whole term. The international investigations on plaice had, however, demonstrated that the plaice within the zones left those areas as they grew, in proportions roughly ascertainable, and also provided material for a very rough and provisional estimate of the effects of closure upon the plaice stock in

the course of one year and at its termination. He laid before the Conference a statement accompanied by tables and diagrams, which gave an answer to the question 1 (a) and included the estimate question 1 (b) referred to. He said that many factors which could not be evaluated would affect this estimate, and did not wish to be understood to support its accuracy, but added that it was based on actual information and was not a mere guess.

Prof. HJORT said that Mr. BORLEY's estimate met the question as far as it was possible to do so. Nevertheless he was of opinion that any conclusions that the Conference might arrive at ought to be based on the reports of the different countries and on the resolutions of the Plaise Committee.

The general sence of the discussion which followed was in agreement with this view.

Mr. MAURICE expressed his satisfaction that his questionnaire should have elicited interesting information in the estimates which had been prepared by Mr. BORLEY and Professor MIELCK which had shown that valuable results might reasonably be anticipated from the closure of areas.

The Conference then proceeded to the second question of the questionnaire.

- 2) Having regard to the occurrence of natural fluctuations in the supply of plaice, would it be possible to prove beyond any reasonable doubt that any increase in landings which might follow the imposition of closure was in fact due wholly or in part, and, if so, to what extent, to the effects of such closure?

Mr. BORLEY expressed the view that while fluctuations undoubtedly occur it would be possible to trace the effects of closure by appropriate means. He could not suggest one simple method of doing this, but thought it practicable by investigations carried out on a large scale, such as plaice marking within the zones, age determinations and investigations on the abundance of plaice of the first two year groups such as Dr. JOHANSEN had conducted on the Danish coast. Insight into the effects of closure would be made possible by such investigations, whether the total landings increased or decreased owing to natural fluctuations.

Prof. MIELCK did not think that the effects of natural fluctuations were so important as suggested by Mr. BORLEY, and he was of the opinion that in most cases it should be possible to distinguish the effect of closure from these fluctuations. He recommended that in addition to Mr. BORLEY's proposed investigations, with which he agreed, quantitative estimations of eggs and larvae should be made.

Dr. REDEKE pointed out that he was not inclined to overestimate the importance of natural fluctuations, as these appeared to be very largely masked by the steady decrease in the annual quantities of plaice landed, a decrease which was broken only by the abnormal accumulation resulting from the war. Nevertheless he was firmly convinced of the necessity for a close study of the conditions prevailing in the zones during closure, to be made on the lines suggested by Mr. BORLEY.

Some further discussion took place.

Mr. MAURICE summed up the discussion by saying that there appeared to be general agreement that the effect of closure could be traced to some extent, but that nothing definite could be said at present.

He suggested that the Conference should now proceed to the discussion of the modifications of the periods of closure as proposed by Professor HEINCKE and Professor MIELCK.

The modifications in the period of closure proposed by the German Experts were then discussed.

Prof. MIELCK said that the intention of the German proposals was to make greater concessions to the steam trawlers than the International Council's proposals, without materially decreasing the essential effect of the closure. From November to February all parts of the zones ought to be opened, as during this period only few plaice of which comparatively small numbers are young plaice are to be caught. They are buried in the ground and do not come out until March. On the other hand a great number of Gadoids are present which come in from deeper water and these could be followed by the steam trawlers if the areas were then opened. For similar reasons in March the Outer Zone may be left open on account of the haddock appearing there in considerable numbers.

Mr. BORLEY stated that in some of the months which Prof. MIELCK suggested should be opened to steam trawling much fishing was carried on by English vessels. Taking the two zones together 34 % of all small plaice landed in 1923 during the periods when closure was proposed by the Council were taken in these months. The criticism had been made that the closure proposed should be increased in order to yield the desired result; and he would regret curtailing the closure in any way.

Mr. JANSSENS agreed from a practical point of view with the German proposals. The Dutch industry wants protection and wants it now. He produced a telegram just received from Dutch fishermen asking for protection for the plaice fishery. There is a general demand among Dutch fishermen for a size limit.

Dr. JOHANSEN said that the German proposals mean a smaller measure of protection than those of 1921 and recommended that the original proposals should be adhered to. He further gave evidence for the view that the small plaice do not always bury themselves during the winter months.

Dr. LE DANOIS said that the French fishing industry agreed to the closure proposed by the International Council, but only if this applied to fishing vessels of all kinds. This would avoid any reproach that the fishing vessels of any particular nation or nations would receive preferential treatment. He appreciated the difficulties as regards the small vessels, and thought that the limited period suggested by the German experts might be more generally acceptable.

Prof. GILSON expressed the same view as Dr. LE DANOIS.

Mr. BORLEY asked whether the Conference might not consider leaving a

zone outside the territorial limit open to fishing and excluding all fishing vessels from the remainder of the closed zone. He did not put this forward as a definite proposal but suggested that it might be explored.

This point was briefly considered and the general opinion was that Mr. BORLEY's suggestion was impracticable.

Prof. HJORT made the suggestion that in order to arrive at a conclusion generally acceptable the restrictions might relate not to vessels but to certain forms of gear. He supported Mr. JANSSEN's views as to the desirability of the introduction of a size limit in all the countries bordering the zones.

Mr. MAURICE emphasised the importance of the remarks made by Dr. LE DANOIS and Prof. GILSON as he knew that the same difficulties were felt by the English industry. He then threw out the suggestion that a way out might be found if it could be stated to the steam trawler interests that the Germans, Danes and Dutch would undertake the transplantation of small plaice to the Dogger Bank on a commercial scale, and thus give some compensation for the immediate sacrifice which the steam trawlers would be called upon to make.

He would come back to this point later on and would now suggest that the Conference should return to the question of the periods of closure.

Dr. JOHANSEN preferred the proposals of the International Council to those of the German Experts, but he admitted that the protection obtained according to the German proposals would be quite considerable, and he thought that Denmark would agree to them, if the international proposals could not be carried through.

Prof. MIELCK wished to add that the German investigators had suggested the modifications in order to facilitate the acceptance of closure by the steam trawlers. From a scientific point of view the Germans agreed with the Council's proposals of 1921, and very probably they would agree from a practical standpoint also. Their principal desire was to see closure commenced as soon as possible.

Mr. JONES said that while Scottish interests were not materially affected by the closure he thought that in order to meet opposition from the British trawlers the modifications might be accepted. The reduced closure would at least be a first step.

Mr. MAURICE expressed the view that it might be easier to secure acceptance of the modified proposal. He understood that these proposals would not secure the whole protection afforded by the closure originally recommended, but thought the modified proposals might be considered from the point of view that "half a loaf is better than no bread".

Dr. LE DANOIS pointed out that the Germans had made a definite effort to meet practical difficulties, and since there was no difference of principle between the German and the international proposals the former might be accepted, possibly with some modification.

After further discussion it was proposed by Dr. HJORT that a resolution be put to the Conference in the following terms:

"Scientifically speaking the Conference in the first instance supports the proposals made in 1921, but secondly, if the introduction of these proposals should meet with difficulties, the Conference would propose that the German modifications be adopted".

Dr. LE DANOIS expressed himself as being in complete agreement with Prof. HJORT, but desired that particular emphasis should be laid on the fact that the Conference fully supports from a scientific point of view the proposal of the Plaice Committee.

Dr. REDEKE felt sure that the Plaice Committee would agree.

On Mr. MAURICE's suggestion the matter was referred to the drafting Committee which would be appointed later for the preparation of a final draft of the resolutions.

Prof. EHRENBAUM said that he would like a phrase added, to the effect that as the closure would be an experiment for 3 years, stress need not be laid on the exact period originally recommended.

The Conference then proceeded to discuss question 3 of the questionnaire.

- 3) Are there any other regulations which, either alone or in combination with one another, and with or without the regulations proposed by the Plaice Committee, could confidently be expected to bring about a substantial improvement, and, in particular (a) could such an improvement be brought about by an international size limit on the lines suggested in 1913, or (b) could it be effected by any practical measures for regulating the meshes of fishing nets, or by the two in combination?

Mr. MAURICE raised the point as to whether it would be possible to combine with closure of areas a prohibition of the use of certain forms of gear in the areas during the periods in which they are open to all fishing.

After a general discussion Mr. MAURICE said it was evident that there was general agreement that regulations as to gear were at present impracticable.

The Conference then proceeded to discuss the question of size limits.

Dr. TESCH made some remarks on the amount of the catch of very small plaice in the Dutch inshore waters and advocated the imposition of a size limit in order to prevent the great destruction of these and other small fish. The destruction which he particularly regretted was due not so much to ordinary fishing but to certain boats which fish exclusively for such very small fish. He was of opinion that the imposition of a size limit of 20 to 22 cms. would meet the objections made against the unrestricted fishing by sailing trawlers.

Mr. MAURICE suggested that the Conference might address itself to the

question as to whether it would consider a size limit necessary in the countries bordering the zones, and to what extent they were justified in neglecting the view that some thinning out of very small plaice was desirable. He also reminded the Conference that Dr. LE DANOIS and Professor GILSON had in the course of the discussions expressed their doubts as to whether the small fish could be returned to the sea alive after capture by small trawlers.

Mr. BORLEY was convinced that there was a strong advantage in the adoption of the size limit in the countries referred to, since it might help to remove the objections to closure entertained by the steam trawlers.

Mr. JANSSENS thought that as a first measure a size limit of 18 cms. for Holland would be advisable.

Prof. MIELCK said that the conditions along the German coast resembled those of Holland. A size limit of 25 cms. would be too high, but one of 20—22 cms. would appear to be acceptable. If it should prove necessary to make some sacrifices in return for the restrictions imposed on the steam trawlers, the adoption of a size limit appeared for the present to be the only acceptable means to this end.

Dr. REDEKE reminded the Conference that the resolutions accepted by the International Council left the question of an international size limit in abeyance. He considered that the question of the size limit was at present simply a national question. He thought that the Conference should advocate the adoption of a size limit of at least 20—22 cms. in the countries bordering the zones.

In the course of a general discussion it was apparent that the Conference considered that no case had been established for the necessity of thinning out the small plaice along the shores of the zone under the conditions of stock prevailing at present.

Mr. MAURICE then put Dr. REDEKE's proposal to the Conference and it was agreed unanimously.

Dr. LE DANOIS and Prof. GILSON reiterated their warning that when the proposals of this Conference came before a Conference appointed to consider a convention for the introduction of the regulations, their respective countries would probably feel obliged to make the reservation that the closure should apply to fishing vessels of all kinds.

Dr. ANDERSSON remarked that the International Council had been investigating the problem of protecting the plaice in the North Sea for about twenty years and that the proposals as to the closure of areas made by the Council are well grounded scientifically. No reservations as to the closure proposed by the Council had been made previously by any of their experts. In order to come to a practical result concerning the protection of the plaice he expressed the hope that after this discussion the drafting Committee would be able to formulate resolutions which could be adopted by all members of this Conference.

After some discussion Dr. LE DANOIS expressed his realisation of the dif-

difficulties under which the small vessels would labour if the views of the French trawling industry were maintained, and was fully prepared carefully to consider any means that could be suggested for their alleviation.

Dr. REDEKE, although of the opinion that the fishing of the small sailing trawlers did very little damage, asked whether it had not always been understood that investigations should be carried on during the three years closure especially in order to estimate the effects of the fishing of these small boats.

Mr. MAURICE replied in the affirmative.

Dr. JOHANSEN circulated a memorandum showing the results of experiments with the Danish seines of different mesh and suggested that further experiments should be made. He was acquainted with the fact that great improvements had been made recently in the construction of the Swedish saving trawl and he suggested that the various countries should apply to the Swedish hydrographical-biological Commission for advice with regard to experiments with that trawl.

The Conference proceeded to discuss the last three questions, no. 4, 5 & 6 of the questionnaire.

- 4) Would it be economically sound to carry out transplantation to the Dogger Bank on a large scale, and, if so, what scale is recommended by the Conference?
- 5) If transplantation to the Dogger Bank is carried out on a considerable scale, what regulations, if any, will be necessary to protect the fish so transplanted against capture before a fair proportion of them have had time to grow to marketable size?
- 6) In the light of the latest information about the supply of fish food on the Dogger Bank, what limit, if any, ought to be set to the number of plaice transplanted to it?

In connection with question no. 6 Mr. MAURICE drew attention to the work of Mr. DAVIS, which had demonstrated that fluctuations in the amount of plaice food on the Dogger Bank undoubtedly occurred.

Mr. BORLEY in regard to question no. 6 expressed the view that there was no need to restrict the number of plaice dealt with in any commercial experiment likely to be undertaken in the near future. He referred to the practically uniform growth rate found in the many years before the war in which transplantation experiments had been made, and the fact that this rate was maintained after the war although the abundance of plaice on the Bank was then many times as great.

In regard to question 5, although the extension of Danish seining to the Dogger Bank had slightly increased the number of transplanted plaice retaken a few months after liberation, he considered no regulations for their temporary protection to be necessary.

He then submitted estimates based on the English experiments of 1923 as to the increase of value of the plaice brought about by transplantation, and provisional estimates of the cost of transplantation of a million plaice according to a scheme agreed by a committee in 1922. A form which he circulated indicated the

proportions in which the various nations might be expected to profit by transplantation.

Dr. JOHANSEN expressed his general agreement with Mr. BORLEY. He said that in his opinion no special regulations would be required for the protection of one million plaice, but that the question of special regulations would have to be considered if as many as 20 or 30 million plaice were transplanted.

Mr. MAURICE summed up by saying that the Conference appeared to consider that transplantation of plaice to the Dogger Bank would be commercially profitable, that no special regulations would be necessary to protect the transplanted plaice, and that no limit need be placed at present on the number transplanted. He concluded by asking that the Danish, Dutch and German delegates should consider the suggestion which he had put forward earlier in the proceedings that the transplantation might be undertaken by their countries.

He then stated that this would appear to conclude the meeting, and the Conference then adjourned for a Procès-Verbal to be prepared by a Drafting Committee consisting of Messrs. H. C. REDEKE, (in the chair), J. O. BORLEY, E. EHRENBaum and A. C. JOHANSEN.

The Procès-Verbal was discussed at the meeting on the 28th of March and agreed to.

After some discussion the Conference agreed that the Procès-Verbal and Resolutions be printed by the Bureau and distributed to the Governments concerned and to such persons interested in the matter, and that it should be left to the Governments to print and distribute the Report and Resolutions in their own languages in order that the fishing industry could learn what had been resolved and how the resolutions were grounded.

Appendix.

Recommendation of the Plaice Committee 1921.

The Plaice Committee having considered the results of investigations carried out by the English, Danish and Dutch investigators in the years 1919, 1920, and the beginning of 1921, and also those of German investigators recently published, are of the opinion that:

- I. The prohibition of fishing by steamtrawlers and motor vessels of more than 50 h.p. in certain areas along the Eastern and Southern shores of the North Sea during certain parts of the year or the whole year would be the most effective method of protecting the Plaice fisheries.

After having discussed Mr. BORLEY's scheme the Committee proposes that these areas should be:

- (A) A zone between the continental coast and 22 metres (12 fathoms) from 52° to 56° N. lat. to be closed during the entire year (Inner Zone).
- (B) A zone between the Inner Zone and 27 metres (15 fathoms) from the latitude of Heligoland to 56° N. lat. to be closed except during the months of April, May and June (Outer Zone)*).

They recommend the review of regulations based upon these proposals three years after their inception.

- II. That in view of the proposals put forward in recommendation I the question of an international size limit may be left in abeyance until the effects of the closure of areas have been determined by investigations directed to this end.
- III. The Plaice Committee recommends transplantation of plaice on a Commercial Scale from some of the coastal grounds to the Dogger Bank. The Committee further recommends that the number transplanted in the first year of the operations should be at least a million plaice (about 100000 kilogrammes) and that these should be caught by the snurrevaad and should be transplanted in well smacks, and that the plaice so transplanted should be kept under observation by marking experiments.
- IV. The Plaice Committee recommends the continuance and development of both biological and physical work directed to the further understanding of the ecology of the plaice and other general bionomics of the region.

*) The attached chart illustrates these areas and the Dogger Bank to which transplantation of plaice has been recommended.

- V. The Plaice Committee recommends the prosecution of further researches directed to the development of efficient saving gear suitable for use in commercial fishing.
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Resolution of the Council at its meeting September 18th, 1922.

The Council has considered these conclusions and the report of the Plaice Committee, with a chart, and finds itself in general agreement with the Committee.

The Council is of opinion that there is clear evidence that the plaice fisheries may be seriously depleted by fishing operations and especially by steam trawling, and that such depletion had already taken place before the war. As a result of the restriction of fishing imposed by the war the number of plaice of the larger categories in the North Sea greatly increased, but there is already evidence of a decline of the stock resulting from the resumption of intensive fishing.

The Council is convinced that the decline at present in evidence will, if existing methods of fishing continue to be employed without modification, be progressive, and that protective measures of restriction will become necessary in the near future. The Council accordingly recommends that regulations should be framed in accordance with the recommendations of the Plaice Committee, in order that the Governments concerned may be ready to act promptly and in concert, in accordance with the necessities of the case. The Council strongly endorses the advice of the Committee that transplantation of plaice on a large scale should be undertaken. It further concurs in the advice of the Committee that any regulations involving the closure of areas to trawling should be reviewed three years after their inception. The results both of transplantation and of restrictive measures should be watched and controlled by scientific observations as closely as possible.

In recommending, subject to the above observations, the measures proposed by the Plaice Committee the Council recognises that the enforcement of restrictive measures without the sympathetic support of the industry may present difficulties. Their practicability, however, appears to the Council to be a matter for the consideration of the Governments of the countries concerned. At present no course other than that recommended by the Committee presents itself to the Council as likely to procure the results required.

