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~~COMMITTEE~~ ON THE PEACEFUL USES OF THE SEA-BED AND THE OCEAN
FLOOR BEYOND THE LIMITS OF NATIONAL JURISDICTION

Second Session

ECONOMIC AND TECHNICAL SUB-COMMITTEE

SUMMARY RECORDS OF THE FIRST TO FOURTEENTH MEETINGS

Held at Headquarters, New York,
from 11 to 27 March 1969

Chairman:

Mr. DENORIE

Belgium

Rapporteur:

Mr. PROHASKA

Austria

The list of representatives is to be found in documents A/AC.138/INF.1 and
Add.1-3, Add.3/Corr.1, Add.4 and 5.

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SUMMARY RECORD OF THE FIRST MEETING

Held on Tuesday, 11 March 1969, at 3.20 p.m.

Chairman:

Mr. DENORME

Belgium

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OPENING OF THE SESSION

The CHAIRMAN declared the session open. He welcomed the members of the Sub-Committee and the observers for Member States, the specialized agencies and other intergovernmental organizations.

One of the most striking features of the report of the Ad Hoc Committee (A/7230) was its emphasis on the extent of the world's ignorance of the marine environment and of the natural resources of the ocean. The General Assembly, in its resolutions 2467 (XXIII) and 2414 (XXIII), had acknowledged the need for research and exploration to fill the gaps in existing knowledge. The new Committee and its two Sub-Committees were not, however, expected to await the results of those scientific activities before embarking on the search for a régime for exploiting the resources of the sea-bed and the ocean floor. The example of outer space activities, in fact, showed how necessary it was to have internationally-agreed principles for exploration and the exploitation of resources in a new environment before such activities were actually undertaken on a wide scale.

It should be noted that industry had not been deterred by the inadequacy of current scientific and technological knowledge from exploring the marine environment. Indeed, its progress had, on the whole, been extraordinarily rapid. For example, as recently as 1964 reliable authorities had held that the value of deposits of manganese nodules on the sea-bed was not such as to justify heavy industrial investment, but one industrial firm had just announced plans for mining such deposits in the early 1970s. It was obviously in the interests of industry that such investments should be protected and its exploitation rights secured by a stable legal régime which was accepted by the world community, and operative paragraph 2 (b) of resolution 2467 A (XXIII) - which was part of the Sub-Committee's terms of reference - was concerned, inter alia, with promoting international co-operation to that end. The Sub-Committee had before it a preliminary note (A/AC.138/6), which had been prepared by the Secretariat at the request of the Main Committee, on economic considerations conducive to promoting the development of sea-bed resources in the interests of mankind.

The Sub-Committee was required to take into account, in its study of ways and means for promoting the exploitation and use of the resources of the sea-bed,

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(The Chairman)

the foreseeable development of technology and the economic implications of such exploitation. As the report of the Ad Hoc Committee had contained very full information on that subject, the first component of the work programme proposed by the Chair made provision for a review of recent technological developments in order to bring that information up to date.

Eventually, of course, the Sub-Committee would have to discuss various forms of legal régimes for the exploitation of sea-bed resources. The appropriate time for such a discussion would be at the third session, when the Secretary-General would have completed the study requested in operative paragraph 1 of resolution 2467 C (XXIII). Consideration of the scope of the long-term programme of oceanographic research would also be deferred until the third session, when the report on that subject to be prepared by the Secretary-General, in accordance with operative paragraph 4 of resolution 2414 (XXIII), would be available.

Mr. ARORA (India), supported by Mr. PINERA (Chile) and Mr. de SOTO (Peru), proposed that the Chairman's statement should be reproduced in full as a document of the Sub-Committee.

The SECRETARY pointed out that that proposal would have financial implications.

The proposal was adopted.*

ADOPTION OF THE AGENDA (A/AC.138/SC.2/1)

The agenda was adopted.

PROGRAMME OF WORK (A/AC.138/SC.2/2)

Mr. PANYARACHUN (Thailand) expressed his delegation's full support for the programme of work (A/AC.138/SC.2/2) proposed by the Chairman for the current session of the Sub-Committee.

* The full text of the statement was issued as document A/AC.138/SC.2/3.

Mr. ARORA (India) endorsed those observations. He pointed out that the Chairman, in his opening statement, had indicated the reasons why the Sub-Committee should review recent developments in the exploration and exploitation of sea-bed resources before embarking on the study envisaged in operative paragraph 2 (b) of resolution 2467 A (XXIII). The Indian delegation approved the list of topics for the preliminary part of that study, as outlined in the Chairman's note and elaborated in the excellent Secretariat paper (A/AC.138/6).

Mr. PINERA (Chile) said that his delegation was prepared to approve the programme of work proposed by the Chairman, on the understanding that the Sub-Committee's terms of reference, as summarized in document A/AC.138/8, covered other matters which would be taken up at the second session, when the necessary documentation would be available.

Mr. de SOTO (Peru) said that he supported the proposed programme of work. The Sub-Committee should, however, bear in mind that although its work at the current session might be confined to that part of its terms of reference covered by operative paragraph 2 (b) of resolution 2467 A (XXIII), the resolution as a whole required it to give special consideration to the interests and needs of the developing countries in all its activities.

Mr. PAVICEVIC (Yugoslavia) expressed his delegation's satisfaction with the programme of work drawn up by the Chairman. It particularly welcomed the second part of the programme, which would give the Sub-Committee an opportunity to lay the foundations for an international régime for the exploitation and use of the resources of the sea-bed which would be devoid of the undesirable practices and operations characteristic of natural resource régimes on land.

Mr. GRABOVSKY (Union of Soviet Socialist Republics) said his delegation regretted that the second component of the proposed programme of work did not contain the phrase "taking into account the foreseeable development of technology and the economic implications of such exploitation", which appeared in the relevant part of resolution 2467 A (XXIII). Moreover, although his delegation had no objection to the reference in the programme to the preliminary note by the Secretariat (A/AC.138/6), that document was not to be considered as defining the scope of the Sub-Committee's consideration of the subject: it was, in fact, a

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(Mr. Grabovsky, USSR)

controversial document in some respects. The basic purpose of the Committee was to promote international co-operation in the new, arduous and expensive task of developing and exploiting the resources of the sea-bed and the ocean floor, and its study of ways and means of achieving that purpose could not be limited to existing methods and practices.

The CHAIRMAN pointed out that the first component of the programme of work provided for consideration of as much of the "foreseeable development of technology and economic implications of such exploitation" as was practicable in a single session. The topics proposed were those in regard to which the Ad Hoc Committee had stressed that technical data were most acutely needed.

The programme of work (A/AC.138/SC.2/2) was adopted.

ORGANIZATION OF WORK

The CHAIRMAN drew the attention of the Sub-Committee to operative paragraph 11 of General Assembly resolution 2478 (XXIII), the effect of which was to request it to consider dispensing with summary records for its meetings. Should the Sub-Committee accede to that request, the Rapporteur would, of course, continue the practice of preparing, from his own notes, reports on the discussion of each subject for submission to the Sub-Committee and incorporation into its final report.

Mr. ST. JOHN (Trinidad and Tobago) said that, in common with many smaller delegations, his delegation was in favour of retaining summary records. Should the Sub-Committee decide otherwise, however, he believed that some form of record - perhaps minutes - of each meeting should be prepared and circulated.

Mr. MIRZA (Pakistan) suggested that the Sub-Committee should consider following the practice recently adopted by the Commission for Social Development of dispensing with summary records except for meetings or subjects which required exceptional treatment.

Mr. PANYARACHUN (Thailand) said that, given the nature of the Sub-Committee's terms of reference, it would be virtually impossible to apply a system for distinguishing in advance between discussions of exceptional importance and

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(Mr. Panyarachun, Thailand)

others. The summary records helped all delegations, and the smaller delegations, in particular, to follow highly technical discussions and report to their Governments on them and should, in his delegation's opinion, be maintained.

Mr. FAKHREDDINE (Sudan) and Mr. de SOTO (Peru) supported those observations.

The CHAIRMAN suggested that, in view of the views expressed by members, the Sub-Committee should decide that summary records of its meetings should continue to be prepared, on the understanding that it might review its decision at a later date.

It was so decided.

The meeting rose at 4.35 p.m.

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SUMMARY RECORD OF THE SECOND MEETING

Held on Wednesday, 12 March 1969, at 3.25 p.m.

Chairman:

Mr. DENORME

Belgium

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CONSIDERATION OF PROGRESS ACHIEVED IN THE EXPLORATION AND EXPLOITATION OF THE RESOURCES OF THE SEA-BED AND THE OCEAN FLOOR, AND THE SUBSOIL THEREOF, BEYOND THE LIMITS OF NATIONAL JURISDICTION AND IN THE TECHNIQUES USED FOR THEIR DEVELOPMENT:

(a) HYDROCARBONS AND SOLUBLE MINERALS; DRILLING

Mr. LIVERMORE (Australia) said that the 1968 forecasts by the Economic and Technical Working Group as to the foreseeable development of technology in the exploration, evaluation and exploitation of the mineral resources of the ocean floor (A/7230, annex I) had been borne out and had justified the cautious optimism felt at the time. His own country's experience of off-shore drilling had shown that the marine environment was by no means conquered. One off-shore oil well had blown out, and the concentrated effort required to bring it under control had entailed a direct cost of some \$5 million. Fortunately, there had been no casualties and no damage to marine life. The causes of the accident were still under investigation, but all evidence suggested that the exploitation of the deposit had been properly conducted in conformity with existing government regulations. That incident demonstrated not only the need for still further improvement and refinement of existing techniques but also the harsh and the difficult nature of the off-shore marine environment and the high degree of competence required both from those exploiting the deposits and from the regulatory authorities.

Mr. McKELVEY (United States of America) gave an account of recent developments in the off-shore exploration and exploitation of petroleum resources and said that in his view the use of the phrase "cautious optimism" in the report of the Ad Hoc Committee (A/7230) had been justified.

Advances had been made on all fronts. Exploration was under way in nearly forty countries, and the off-shore contribution to total petroleum output outside the socialist countries had now reached 16 per cent. However, the rupture of an oil well in the Santa Barbara Channel and the consequent damage to marine life and beaches had emphasized the need for improvements in both technology and operations. Success did, on the other hand, appear to have been achieved in the quest for alternatives to dynamite, which was expensive and dangerous, for reflection seismic surveys and the digital recording of data collected by non-explosive energy sources now permitted computerized analysis and, in consequence, the use of a wider range of interpretative procedures.

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(Mr. McKelvey, United States)

The drilling ship, Glomar Challenger, which was sponsored by the National Science Foundation, was continuing its successful voyage and had set a new record for penetration into the ocean floor. A hole had been drilled to a depth of 2,740 feet in an area where the water depth was 16,316 feet. The direct observation of petroleum at such depths, although not necessarily in recoverable quantities, was highly significant even if technological advances did not yet include re-entry capability or the capability to test adequately for oil and gas. As to drilling with re-entry capability, new records had also been set, a depth of 1,350 feet having been reached in the Santa Barbara Channel. New plans to drill to 2,000 feet and more included the use of an occupiable cylinder moored to the ocean floor and surrounded by a ring of automatically operated well heads. The cylinder equipment would be controlled from the surface, but it would be serviced by a submersible and be occupied intermittently. Progress in the technology for deep submersibles was being made under the Sealab, Tektite and other programmes.

One among several important new developments in off-shore storage and loading techniques was the construction of a 500,000-barrel submarine tank in the Persian Gulf. At 150 feet below sea level, the tank would be less vulnerable to storm damage and would provide convenient loading for supertankers.

Although recent developments had brought the prospect of large-scale economic exploitation closer to reality, it was difficult to predict the rate of increase in the world demand for fluid hydrocarbons from off-shore sources, the extraction of which, according to Shell's figures, was about three times as expensive as on land. Indeed, the possibility of a technological break-through in synthetic fuel production or in the competitive use of electricity for traction or heating purposes had clouded speculation even with regard to land-based oil production increases. Nevertheless, the prospect of off-shore discoveries large enough for economic extraction had brought about an increase in the total investment for that purpose to \$13,000 million, notwithstanding the possibility of future land discoveries on the scale of the deposit on the Arctic Slope of Alaska.

There were, on the other hand, certain factors which might hold back the expansion of off-shore production: the imposition of more stringent, and consequently more expensive, safety measures as a result of public concern over the disastrous effects of blow-outs like the one in the Santa Barbara Channel; and economic and

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(Mr. McKelvey, United States)

political measures adopted by Governments for domestic reasons or in pursuance of international agreements to establish a régime for the exploitation of resources underlying the high seas beyond the limits of national jurisdiction.

In view of the various uncertainties and on account of the time that would be required to develop drilling technology to the stage where deep-water extraction would become competitive with on-shore and shallow-water extraction, it appeared unlikely that more than a small fraction of off-shore oil production, which was likely to supply about 30 to 35 per cent of the world market by 1980, would originate at depths of more than 2,000 feet.

Mr. DEJAMMET (France) said that as seismic surveys had proved to be generally the most accurate and effective of the geophysical techniques employed to detect mineral deposits, French technicians had endeavoured to adapt that method to the exploration of the sea-bed. To date, the operational techniques used at sea were based on the use of instruments employed on land. The work was considerably simplified because there was no necessity for drilling, the explosive charges being detonated directly in the water, and because the hydrophones could be arranged along cables towed by ship. Nevertheless, there were three main disadvantages in the use of the seismic method at sea: (a) the size of the charges detonated could result in damage to marine fauna; (b) the gas generated by the explosion seriously disturbed the recording process; and (c) the behaviour of seismic waves in water was such as to produce echoes which frequently affected the results. To overcome those drawbacks, the Institut Français du Pétrole (IFP) had developed a new technique, the Flexotir method, which did not cause any destruction of marine life and made use of explosive charges of only 100 grammes, as opposed to 15-20 kilogrammes previously. In general, the use of geophysical methods at sea still presented one serious difficulty: that of precisely determining the location of deposits. Existing radio navigation networks were not sufficiently accurate, although that problem might eventually be overcome by the use of artificial satellites. Exploration of the sea-bed by seismic methods was rapid and some five times less expensive than similar work on land. The same applied in the case of magnetometric surveys.

The equipment used in the next stage of exploration - namely, drilling - had been developed and diversified with extraordinary speed in recent years. Drilling equipment proper used at sea scarcely differed from that used on land. The main

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(Mr. Dejammet, France)

problem was the means of supporting the drilling installation. At the outset, permanent structures such as artificial islands had been used and still were employed when the depth of water and geological conditions allowed. The next stage had involved the design of structures which, although mobile, rested on the sea-bed during drilling operations. Two types of such platforms existed: submersible barges, using ballast tanks, and floating platforms with retractible piles. The next stage had been drilling carried out from a ship or a semi-submersible platform.

As to the future prospects for the exploration of the mineral resources of the sea, a major problem was the almost total lack of knowledge of the geological structure of the sea-bed and ocean floor. Bathymetric charts, while based on accurate soundings, gave no indication of the structure of the sea-bed in between the points at which the soundings were taken. Beyond a certain distance from the coast, radio navigation - which was often inaccurate - was the only means of fixing positions. Consequently, there was a need for the establishment of geodetic networks using high-frequency beacons and for the development of surveying techniques to replace those used on land.

French technicians were now developing equipment to increase their knowledge of marine geology. Lateral sonars had been developed by IFP and could produce "sound photographs" of the sea-bed similar to aerial photographs. In addition, relatively accurate details of the uppermost strata of the sea-bed could be obtained by measuring the speed of sound passing through those strata. Information obtained by those and similar methods was processed by computer to produce charts of the sea-bed which could be completed by sampling. Thus, modern oceanography was increasingly resorting to electronic methods of obtaining and processing data. IFP technicians had also developed a whole range of equipment for obtaining geological samples from the sea-bed prior to the installation of structures on it. That equipment could be used even by ships which had not been specially adapted for it.

Scientists studying the sea-bed tended to carry out most of their research from floating platforms as opposed to working under the surface. To keep such structures in position, IFP technicians had developed techniques to replace the traditional system of anchors and chains, which could no longer be used because of the very considerable stress placed upon them, particularly during storms. The new techniques involved the use of propulsion systems linked to instruments that

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(Mr. Dejammet, France)

showed the position of the platform by measuring the angle of a cable between the platform and the sea-bed. Various devices - which included specially-balanced working tables - were used to absorb the effect of the movement of the platform caused by waves. In carrying out traverses at sea, exceptionally flexible cables had been found to be particularly suitable.

Current research into deep-sea diving was directed towards establishing the ideal gaseous mixtures for use by divers and determining the decompression stages necessary as the result of exposure at various depths for various periods. Some five hours of decompression was necessary following one hour of work at a depth of 100 metres. Thus, it was advantageous to keep the teams of divers under pressure in underwater compartments during the intervals between their periods of work. Experiments had been made with two types of pressurized compartment, one anchored on the sea-bed and containing all necessary equipment for the divers and the other anchored on the surface with divers moving between it and the sea-bed in a diving bell. It was too early to say which method French technicians would finally adopt although experiments to date indicated that the combination of an underwater compartment with a submarine carrier vehicle would be the ideal solution.

The use of submarine vehicles combined the advantages of working in the conditions prevailing on the surface with those of working at considerable depths and eliminated the physical and psychological drawbacks of the other methods. His country had built a submarine vehicle for use at depths of 200 to 300 metres and was preparing one for use at a depth of 3,000 metres. Considerable scientific and technical research was obviously needed in connexion with such vehicles but was justified by their past contribution to the oceanographic sciences.

Mr. FLEMING (United Kingdom) referred to paragraph 2 (a) of General Assembly resolution 2467 A (XXIII) and paragraph (i) of document A/AC.138/8 and pointed out that no reference to them had been made in paragraph 2 of the Sub-Committee's programme of work (A/AC.138/SC.2/2). He considered that paragraph 2 of document A/AC.138/SC.2/2 was more important than paragraph 1 and that the Sub-Committee should certainly discuss the conditions that would have to be met by any régime in order to comply with the technical and economic features of current and future methods of exploiting the sea-bed.

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(Mr. Flemming, United Kingdom)

The primary task of the Sub-Committee was to ascertain the best way of encouraging the processes listed in paragraph 2 (b) to (e), and in performing that task, it should keep current technological developments in mind so as to ensure that its conclusions were realistic.

With regard to the technological time-scale advanced in 1968 by the United Kingdom delegation at a meeting of the Economic and Technical Working Group and with regard to the forecast of the Working Group in paragraph 16 of its report (A/7230, pp. 26-27), they both appeared to be accurate inasmuch as it was likely that for several years to come the volume of total mineral production at depths of more than 200 metres would be only a small proportion of the total off-shore production.

Evaluation drilling during 1968 had reached a depth of 400 metres, which was well within the limits forecast, and although scientific drilling had not improved on the 1968 depth of 6,000 metres, a large number of new holes, as the United States representative had reported, had been drilled at that depth by the Glomar Challenger. Furthermore, design studies had been carried out to improve on the 1968 depth of 60 metres achieved in production dredging for surficial minerals.

Improvements in the scale and extent of exploration and production were heavily dependent on services and equipment, such as underwater navigation aids, acoustic and seismic penetration survey devices, measuring and recording devices for use underwater, acoustic telemetry, command and release systems, diving and underwater-living equipment, submersibles, underwater cameras and television equipment. Fortunately, interest in such equipment was increasing; there had, for example, been 200 exhibitors at the first International Conference and Exhibition of Oceanology and Marine Technology which had been held at Brighton, England, in February 1968 under the sponsorship of the British Society for Underwater Technology. That Conference had been attended by 2,000 engineers, scientists, administrators, businessmen and government officials from thirty-five countries, and 120 technical and scientific papers had been presented. Meetings of that sort were the best way of encouraging the rapid development of marine technology. Also, the pooling of knowledge, techniques and equipment would ensure that technological capacity would be increased on an international scale and at the rate indicated in the Ad Hoc Committee's report.

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The CHAIRMAN, summing up, said that one of the important points made during the discussion was that knowledge of the geological structure of the sea-bed was virtually non-existent and that such knowledge was a prerequisite for exploration. It was also of interest to the Sub-Committee to learn of the recent evidence that accumulations of sediment might exist at greater depths than had been implied in the Ad Hoc Committee's conclusions (A/7230, annex I, para. 6).

The accounts given of technological developments in recent months had substantially confirmed the Ad Hoc Committee's forecasts of the probable future progress of technology. Further technological innovations were to be expected in the near future, but recent events had shown that special emphasis was required on methods of preventing accidents in off-shore operations. Indeed, the accidents referred to had served to illustrate how difficult the exploitation of marine minerals was and how high a level of technical expertise was needed for such operations.

A number of references had been made to factors which might in the foreseeable future affect the demand for intensive exploitation of sea-bed hydrocarbons, such as the development of synthetic hydrocarbons, and the progress of research on new forms of energy that would be competitive with hydrocarbons.

The meeting rose at 4.35 p.m.

SUMMARY RECORD OF THE THIRD MEETING

Held on Thursday, 13 March 1969, at 3.15 p.m.

Chairman:

Mr. DENORME

Belgium

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ORGANIZATION OF WORK

Mr. PROCHASKA (Austria), Rapporteur, informed the Sub-Committee that he proposed to prepare unofficial, English-language notes covering the main features of the debates, as he had done in 1968. The notes were intended to enable delegations to follow the Sub-Committee's proceedings more easily and to provide a basis for the draft interim report, which he was planning to submit during the last week of the session. He hoped that members would study the notes, but as they had no official status, he urged them to communicate their comments to him privately.

CONSIDERATION OF PROGRESS ACHIEVED IN THE EXPLORATION AND EXPLOITATION OF THE RESOURCES OF THE SEA-BED AND THE OCEAN FLOOR, AND THE SUBSOIL THEREOF, BEYOND THE LIMITS OF NATIONAL JURISDICTION AND IN THE TECHNIQUES USED FOR THEIR DEVELOPMENT (continued):

(a) HYDROCARBONS AND SOLUBLE MINERALS; DRILLING

Mr. EVENSEN (Norway) said that although for technical and economic reasons drilling for hydrocarbons had so far been confined to the continental shelf, the deposits of oil and gas that had been discovered were so vast that the world's oil reserves would not be seriously affected if exploration in more distant areas was ignored for the next two decades. Nevertheless, such a restriction was undesirable, even for a limited period of time.

The possible existence of large reserves of hydrocarbons in parts of the ocean floor had been indicated in document E/4449/Add.1 in 1968 and was being confirmed by the results of the Glomar Challenger's exploration activities, while drilling techniques were progressively being adapted to deep-water operations.

The Glomar Challenger was no mystery ship, but rather a conventional, surface drilling ship of modern, advanced design. Since it was operating primarily in areas with which the Sub-Committee was concerned, members would also be interested in the information about the ship published in the third report of the President of the United States to Congress on marine resources and engineering development (January, 1969, pp. 178-179).

Everything pointed to the fact that a very important era of off-shore mineral extraction was about to begin and there were a number of problems that the Sub-Committee ought to discuss, without encroaching on areas within the competence of the Legal Sub-Committee. Those problems were primarily safety, conservation and pollution. Traditional maritime dangers made drilling, which was hazardous

(Mr. Evensen, Norway)

enough on land, particularly dangerous at sea and no type of rig was invulnerable to storms. Blow-outs and leakages could, of course, be disastrous. Although, as the representative of France had said, the new seismic survey techniques being developed would not need explosive charges, dynamite, a hazard to fish, ships and trawlers, was still being extensively used. It was therefore in the legitimate interests of the world community to eliminate irresponsible practices, particularly at the production stage, when a blow-out or leakage might pollute vast expanses of ocean for several years and waste valuable natural resources.

Very few countries had so far passed safety legislation, even for oil drilling in their own continental shelf and it was important for the Sub-Committee to draw the attention of the whole world to the need to adopt comprehensive safety measures, based on the principles of international law, so as to eliminate the many dangers inherent in the exploration and exploitation of oil in marine areas.

Mr. ROMAGNOLI (Italy) reminded the Sub-Committee that the barrier of great depth had not yet been overcome and that, since no company, State or international agency would undertake uneconomic off-shore exploitation, technological progress alone was not all that had to be achieved. There were a number of other important factors to be considered, such as the effect on production costs of exploitation at greater distances and depths, the possibility of market prices being affected by an excess of supply over demand and the impact on scientific and technical research activity. That activity would come to a halt in the event that an unrealistic régime was set up.

Italy, through its national oil corporation, ENI, had been in the forefront of European off-shore exploration since 1959, and its semi-submersible Scarabo II was currently using the most up-to-date drilling techniques and equipment. Research was being carried out on the impending problems of well completion, re-entry capability on fixed platforms, on underwater and above water completion, and on laying pipelines at great depths. In short, excellent experience was being acquired by Italian industry, and it would be made available to other countries for the benefit of mankind as a whole.

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Mr. GRANELLI (Argentina) said that his delegation had noted with satisfaction the progress achieved by the United States Joides programme of deep-water drilling and the oceanographic research advances made by the Glomar Challenger.

Argentina's efforts in sea-bed research had been concentrated in the southern hemisphere, and, since the launching of the International Geophysical Year, its scientists had taken part in several national and international expeditions. They had collaborated with oceanographers of international repute in charting the topographical features of the ocean floor that had hitherto been unknown. The assistance and support from Professor Ewing in the early stages of their research into marine geology and geophysics had been invaluable.

During the same period Argentina's continental shelf was also being explored for industrial purposes and the data collected had been made known through international oceanographic publications. One result of that exploration was the evaluation of the mineral resources potential of an area of almost a million square kilometres within national jurisdiction. In the short space of five years, the work had provided the basis for a vigorous national energy policy and for the Hydrocarbons Law (No. 17319). Under the provisions of the latter, exploration concessions had been granted from Tierra del Fuego to the Rio de la Plata, and in April 1969, seismic and magnetic surveys having been completed, drilling ships, using jack-up rigs, were scheduled to start work.

Beyond the limits of national jurisdiction, topographical surveys of the ocean floor were being carried out by the Argentine Navy under technical assistance agreements with the domestic petroleum industry and in collaboration with the science and engineering schools of Buenos Aires University. In addition to its regular vessels, the navy was using the "Ex Atlantis I", acquired from the United States and renamed "El Austral".

In September 1969, Argentina would launch, as part of the International Upper Mantle Project, a Geotraverse expedition to study the crust of the ocean floor in the latitudes between Central Patagonia and the Falkland Islands. The expedition's most important contribution would be in the application of the most modern seismic survey techniques using digital magnetic registration.

(Mr. Granelli, Argentina)

Argentina's National Oceanographic Committee was now preparing the national programme for the proposed International Oceanographic Decade, and the exchange of oceanographic information with other countries was being carried out through world data centres, as provided by the Intergovernmental Oceanographic Commission.

Argentina supported the objectives of General Assembly resolutions 2340 (XXII) and 2467 (XXIII), would continue to participate in international expeditions and invited interested nations to take part in its own scientific research and exploration.

Mr. GAUCI (Malta) concurred with the view of the United Kingdom representative that paragraph 2 of the Sub-Committee's programme of work was of paramount importance, since a free-for-all was something to be avoided and in one country, a competitive bid of \$21 million had recently been made for exclusive rights to a four-and-a-half square mile area at depths of over 1,200 feet.

The information on recent developments that had been given to the Sub-Committee at its second meeting was most welcome, particularly the news that the know-how being acquired by private industry all over the world would be made available to the world scientific community.

From the 1968 interim report of the National Petroleum Council and statements by the scientific adviser to British Petroleum and by the President of Ocean Science and Engineering, it was clear that great advances were being made in deep-water drilling and mining technology. Experiments were being conducted to determine the physiological and psychological effects of high pressure on man and it appeared that, provided the right inhalation gas was chosen, there would be no difficulties at pressures of about fifty atmospheres.

It was also encouraging to note that copper production from submarine sources might reduce costs by 50 per cent and that economies of 80 per cent were feasible in the case of nickel and cobalt. Natural gas, too, was being produced from off-shore deposits at costs low enough to allow substantial margins on current market prices.

One instance of the progress made in other fields was the development of a seismic device which was cheaper, safer and more accurate than traditional seismic methods involving the use of explosives. Furthermore, a new sonar detector had revealed gold deposits in the South Pacific estimated to have a value of \$100 million. Under-sea oil containers, aqueducts and artificial ice-islands for

(Mr. Gauci, Malta)

mooring tankers near off-shore wells were receiving serious consideration and an under-water bulldozer had been developed which could travel along the sea-bed at two miles per hour. Machines were being used for work hitherto limited to deep-sea divers. Among the many new research vessels launched was a nuclear-powered ship costing \$70 million and capable of exploring an underwater area several times larger than some continental land masses. Expert estimates indicated that some 98 per cent of the ocean floor could be reached by submarine vehicles in 1969.

The potential market towards which such advances were directed had been reliably estimated in one country at nearly \$8,000 million in 1967 and was expected to increase threefold during the coming decade to some \$24,000 million of which private industry's share would be 90 per cent and that of the governmental sector only 10 per cent. It was logical to assume, therefore, that private enterprise would exert an important influence on policy decisions. Several large companies were predicting substantial profits from their oceanographic activities as early as 1971. In most of the developed countries, the government sector was becoming increasingly involved in oceanography. The leading country in the field had doubled its oceanographic expenditure every three years in the last decade. Most of the fourteen States participating in the recent oceanographic exhibition at Brighton had at least doubled their oceanographic expenditure during the previous year. He very much doubted whether the same could be said of the developing countries; the technological advances were the achievement of a very few. In the circumstances, the Committee should bear in mind that in the final analysis, its mandate was to endeavour to promote the peaceful exploration of the ocean floor for the benefit of all mankind.

Mr. GRABOVSKY (Union of Soviet Socialist Republics) said that exploration of the sea-bed had assumed great importance and was carried out over wide areas at great depths. Whereas ten years previously only five countries had been engaged in such exploration, more than sixty-six States were now engaged in drilling for gas and petroleum in order to meet the increasing need for those products for industrial purposes. World fuel consumption had increased tenfold in the past decade and could be expected to increase greatly in the future. In 1965 petroleum had accounted for some 35 per cent of the world power output and natural gas for some 18 per cent. In the USSR, petroleum and natural gas accounted

(Mr. Grabovsky, USSR)

for 52 per cent of the total power output, a proportion which was expected to increase.

Nevertheless, the discovery of new fuel sources was lagging behind the demand. In many countries, there were limited prospects of discovering new petroleum and natural gas deposits on dry land. Marine prospecting should therefore be continued, despite its relatively greater cost. It had been estimated that some 16 per cent of the world's energy was provided by petroleum and gas deposits discovered in off-shore and shore areas, the continental shelf and off-shore zones being the most favourable areas for exploration. Such exploration was particularly important in countries with extensive coast and lake shorelines. The considerable scope for marine exploration had been amply demonstrated in recent years in countries such as Japan, Australia, United Kingdom, the Netherlands and the Federal Republic of Germany and in countries such as Iran, the United States and the USSR, which had a highly developed natural gas industry.

In the USSR, drilling was currently in progress in the Caspian Sea at depths of 30 to 60 metres and would be conducted at depths of 80 to 100 metres in the near future. Drilling was also in progress in the Baltic, Arctic and Barents Seas, in Pechorskaya Bay and in Far Eastern waters. In the near future, emphasis would be placed on exploration of the off-shore areas of the Okhotsk Sea, Kamchatka and North East Sakhalin.

There was a need to explore areas which had not been considered economically exploitable. Increased attention should be given to the study of technology for exploration and drilling at greater depths. The specialized equipment which would be needed was being developed and studies of environmental factors such as tidal systems were being carried out. However, scientists considered that, even allowing for technological progress, much time would be needed before the commercial exploitation of the various types of resources lying beyond the limits of the continental shelf became feasible. The exploitation of the sea's resources was one of the most challenging and complicated problems of contemporary oceanology; it was comparable to the conquest of outer space.

The Soviet Union was ready to participate in a systematic, long-term programme of geological and geophysical research within the framework of the Intergovernmental Oceanographic Commission of UNESCO.

Mr. FLEMMING (United Kingdom) recalled that several speakers had pointed out that the 1968 forecasts of the Economic and Technical Working Group concerning the development of technology had been justified by subsequent data and that the rate of progress achieved had been as expected. The progress, however, had been uneven. In 1968, experimental penetration drilling for scientific purposes had been carried out in water depths of 6,000 metres and the research ship Glomar Challenger had not carried out drilling at greater depths since that time. Furthermore, billy-goats had been exposed at depths of 1,800 feet several years before the 1969 French experiments. Divers had now been exposed in chambers at depths of 1,300 feet but had suffered extremely severe physiological effects. With regard to expenditure on oceanography, it was difficult for a Government to double its outlay in one year. His own Government was trying to expand its oceanographic activities as fast as possible but, due to difficulties in, for example, the recruitment of qualified personnel, its expenditure was increasing at a rate equivalent to a doubling in five years.

The CHAIRMAN said that several delegations had drawn attention to the extensive oceanographic research programmes now being conducted by a number of States and had emphasized the degree of international co-operation which existed. Hydrocarbons appeared to be the resource attracting most attention and the exploitation of hydrocarbon deposits was probably the first task to be accomplished in deep water. Some delegations considered that the exploitation of deep-sea resources would soon be possible. It was also generally agreed that some regulatory machinery was necessary if exploration and exploitation of marine resources was to proceed without hindrance.

Several speakers had drawn attention to the importance of foreseeing the various dangers inherent in the exploitation of petroleum and natural gas deposits, such as pollution, explosions and navigational hazards, and had indicated the need for security measures. There seemed to be some uncertainty as to the exact correlation between the 1968 forecasts of technological developments and the latest specialist data.

(b) SURFICIAL DEPOSITS AND DEPOSITS WITHIN BEDROCK; DREDGING AND MINERAL EXTRACTION

Mr. McKELVEY (United States of America) said that advances in the off-shore mining of hard minerals had not been as rapid as those related to

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(Mr. McKelvey, United States)

hydrocarbons. Progress in solving the problem of evaluating mineral deposits had been achieved by the development of a detached corer which was brought to the surface by a float after sampling the sea-bed. A series of such devices could be dropped from a moving ship carrying out a traverse and picked up on its return. A sediment analysis pod had also been developed which could transmit technical data to the surface by cable. A new radioisotope-powered acoustic pinger with a five-year life span could be used at depths of up to 6,000 feet and could precisely mark undersea locations, a fundamental need in both mineral evaluation and mining. The advances in geophysical exploration already mentioned during the debate had also contributed to the development of hard mineral technology.

Mining was in progress at depths of less than 200 feet off-shore in many countries, among them Australia, Iceland, Indonesia, Japan, Malaysia, Mexico, the Philippines, Thailand, United Kingdom and the USSR. The minerals recovered included sulphur, sand, gravel, tin, diamonds, gold, chromite and tungsten. Research was in progress with the view to the economic recovery of nickel and copper from manganese nodules; one United States company believed that it would be producing metals from them within five years.

Current exploration might lead to off-shore mining in new areas but none of the developments in the previous year constituted breakthroughs which would substantially enlarge the scope of marine mining in the near future or accelerate economic access to deep-water mineral deposits.

Ore-finding technology, particularly for bedrock minerals beneath the ocean floor, was poorly developed and the geological knowledge necessary to guide prospecting was still fragmentary. Evaluation technology for most sub-sea minerals was weak and expensive. Low-cost systems for deep sea mining had scarcely progressed beyond the conceptual stage and each of the major surficial deposits presented difficult beneficiation or extraction problems. Low-cost on-shore sources for most sea-bed minerals were ample for the foreseeable future and reduced the incentive for the development of deep-sea mining technology. Nevertheless, it seemed certain that such technology would eventually be developed. A real breakthrough which would reduce costs to competitive levels would have a substantial impact on world supplies in the case of manganese nodules, and possibly sulfide muds, and on regional supplies in the case of phosphorites.

The meeting rose at 4.35 p.m.

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SUMMARY RECORD OF THE FOURTH MEETING

Held on Friday, 14 March 1969, at 3.25 p.m.

Chairman:

Mr. DENORME

Belgium

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CONSIDERATION OF PROGRESS ACHIEVED IN THE EXPLORATION AND EXPLOITATION OF THE RESOURCES OF THE SEA-BED AND THE OCEAN FLOOR, AND THE SUBSOIL THEREOF, BEYOND THE LIMITS OF NATIONAL JURISDICTION AND IN THE TECHNIQUES USED FOR THEIR DEVELOPMENT (continued):

(a) HYDROCARBONS AND SOLUBLE MINERALS; DRILLING

Mr. CROSBY (Canada) said that interest in Canadian off-shore mineral resources had so far been centred almost entirely on petroleum. Exploration activities were only now gaining full momentum and there had been no large-scale off-shore exploration for hard minerals. That was as much a reflection of his country's considerable on-shore mining potential as of the limited stage reached in the development of off-shore mining technology.

The extensive nature of the petroleum exploration programmes off the Canadian coast was an indication of future developments in the exploration of the deep ocean floor. Some two thirds of the expenditure on off-shore exploration had been devoted to mainly seismic geophysical surveys using the latest non-explosive techniques and data processing methods. With regard to implications for the future development of off-shore mineral resources, the salient features of the surveys had been the wide area covered and the range of water depths at which they had been carried out. Off the east Canadian coast they had been conducted over an area stretching for some 2,000 miles, and, off the west coast, over a 500-mile stretch. Seismic surveys had been carried out in water depths commonly ranging to more than 200 metres and in some cases to approximately 2,000 metres. Of late, more exploratory drilling was being conducted off the Canadian coast. There had been core drilling at depths of more than 1,000 metres as early as 1965, but the greatest depth for a deep exploratory well to date had been some 170 metres.

As to plans for drilling in the immediate future, two of the largest semi-submersible drilling units in the world were being built at Halifax for extensive drilling programmes off the east coast. They were of the same design and would cost some \$12 million each. They could drill to 25,000 feet and would be able to operate in 800 feet of water throughout the year. The first programme was to begin in the latter part of 1969, and the second in the spring of 1970.

A similar semi-submersible drilling unit, built at a cost of some \$10 million, had been sinking deep exploratory wells along the Canadian west coast shelf on a year-round basis since mid-1967. It could drill to depths of 2,000 feet and had

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(Mr. Crosby, Canada)

been designed to operate in 600 feet of water in all kinds of weather. A feature of particular interest with regard to the future development of off-shore mineral resources was the fact that the units had been designed for deep-water drilling operations throughout the year in open seas notorious for rough weather conditions.

He was not suggesting that the production of petroleum from the deep ocean was likely in the immediate future. Although the technology was developing rapidly, as was the world demand for petroleum, there were still many economic factors which must be taken into consideration as well as many unsolved technological problems. It seemed clear that some considerable time would elapse before a meaningful evaluation of the mineral potential of the off-shore areas beyond the limits of national jurisdiction would be possible.

The CHAIRMAN announced that Dr. Maurice Ewing of the Lamont Geological Laboratory of Colombia University would be able to give an illustrated lecture of the work of the research vessel Glomar Challenger on 18 March 1969 at 12 p.m. If there was no objection, he would take it that the Sub-Committee wished him to make the necessary arrangements with the Secretariat.

It was so decided.

(b) SURFICIAL DEPOSITS AND DEPOSITS WITHIN BEDROCK; DREDGING AND MINERAL EXTRACTION

Mr. GAUCI (Malta) said that the statement made earlier in the debate, that more than sixty-six countries were actively engaged in off-shore exploration programmes gave the impression that all the countries were financing such operations from their own resources. His understanding was that while such programmes were being conducted off the coasts of some sixty-six countries, not all of them were being financed by the countries concerned.

He asked whether the United States delegation could make available to the members of the Sub-Committee copies of a paper on manganese nodules prepared by one of its experts.

Mr. ARORA (India) endorsed the Maltese representative's remarks regarding the number of countries actively engaged in off-shore exploration.

The CHAIRMAN observed that the Sub-Committee had considered sub-item 1 (b) in some detail. It appeared from the debate that there had been no

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(The Chairman)

revolutionary innovation in the recovery of hard minerals from the sea-bed which would modify the Ad Hoc Committee's conclusions in 1968. There were a number of reasons why progress in that field had been slower than in the case of hydrocarbons, a main factor being the problem of the extraction and processing of nodules. It appeared, however, that industrial circles were beginning to look upon the sea-bed as a considerable and economically exploitable source of minerals.

If there was no objection, he would take it that the Sub-Committee had concluded its debate on sub-item 1 (b) and agreed to take up item 2 (a) at its next meeting.

It was so decided.

The meeting rose at 3.45 p.m.

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SUMMARY RECORD OF THE FIFTH MEETING

Held on Monday, 17 March 1969, at 10.55 a.m.

Chairman:

Mr. DENORME

Belgium

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PRELIMINARY STUDY OF THE WAYS AND MEANS OF PROMOTING THE EXPLOITATION AND USE OF THE RESOURCES OF THIS AREA, AND OF INTERNATIONAL CO-OPERATION TO THAT END, BEARING IN MIND THE FACT THAT SUCH EXPLOITATION SHOULD BENEFIT MANKIND AS A WHOLE (RESOLUTION 2467 A (XXIII), PARAGRAPH 2 (b); PRELIMINARY NOTE BY THE SECRETARIAT, IN ACCORDANCE WITH THE DECISION TAKEN BY THE COMMITTEE ON 7 FEBRUARY 1969) (A/AC.138/6 and Corr.1):

(a) GENERAL CONSIDERATIONS

Mr. de BREUVERY (Representative of the Secretary-General) said that the preliminary note by the Secretariat (A/AC.138/6 and Corr.1) was intended as a brief outline of certain economic considerations relating to the development of the resources of the sea-bed and ocean floor beyond the limits of national jurisdiction. The Resources and Transport Division of the Department of Economic and Social Affairs, which had prepared the note, had not sought to recapitulate in detail the questions which had been considered the previous year in the Economic and Technical Working Group with regard to the economic implications of exploiting the resources of the sea-bed and the ocean floor. The debates on that subject were a matter of record. Since the exploitation of those resources was still in its infancy, it was impossible to give a comprehensive account of measures proved to be effective. The note therefore was of a tentative nature and left many questions unanswered. It would, however, serve its purpose if it stimulated discussion in the Sub-Committee on how those questions might be answered. Part II of the note might be especially helpful in that regard as it dealt with particular problems related to the economics of marine mineral resources development.

Mr. LIVERMORE (Australia) expressed appreciation for the thought-provoking preliminary note prepared by the Secretariat. That document would be of assistance to the Sub-Committee in its important task of devising a scheme of arrangements to develop the resources of the sea-bed beyond the limits of national jurisdiction in the interests of mankind as a whole.

Excluding those areas of the sea-bed and ocean floor which fell under national jurisdiction, it was still possible that the Sub-Committee was considering the fate of close to half of the world's surface. Although that area was virtually unexplored and largely uninhabitable, it was reasonable to expect that mineral resources existed there. The nations of the world were endeavouring to ensure that

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(Mr. Livermore, Australia)

those resources remained the legacy of all human beings. Until those resources were extracted and brought to the market places of the world on a basis competitive with minerals from land, there was no prospect of any tangible benefit to mankind as a whole. It was therefore important to study the techniques of mining on-shore mineral deposits and to investigate their applicability to off-shore mining.

Any arrangement for exploiting the resources of the sea-bed and the ocean floor in the interests of mankind must be effective, credible and impartial. Over a hundred years ago, his country had experienced an urgent need to develop an effective, credible and impartial system for the exploitation of a newly discovered natural resource - gold. The Government had at that time issued exploratory permits, registered land claims and arbitrated any disputes which arose through the institution of Warden's Courts. Under that regulatory system, a miner felt confident and secure in his claim. More recently, the Federal and state Governments of Australia had enacted special legislation to ensure the effectiveness of titles to off-shore petroleum deposits. Since then, exploration had increased dramatically because entrepreneurs felt that their rights would be protected. Any international arrangements to develop the resources of the sea-bed and ocean floor must likewise instil confidence in the minds of operators that rights granted would be, and could be, upheld. Fair treatment must be ensured, and the scheme of arrangements must command the confidence of all the nations of the world.

There would be a need for some sort of regulatory authority in connexion with whatever arrangements were devised. His delegation did not wish to advocate any particular form of authority before it had an opportunity to consider the report to be prepared by the Secretariat pursuant to General Assembly resolution 2467 C (XXIII). However, it was apparent that the regulatory authority must have within itself, or have access to, highly competent technical and professional personnel. It must be flexible and sensitive if it was to react quickly and decisively to new and complex situations. In view of the exceedingly high operating costs of marine oil-drilling rigs, delays in decision-making could have prohibitively expensive consequences. Yet the decisions would have to be right in view of the risk of pollution and waste of resources in the case of a blow-out. The regulatory authority would also have to be competent to reconcile the

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(Mr. Livermore, Australia)

conflicting needs of several users in one marine area, although that problem might be more amenable to solution than appeared at first sight. In Australia, for example, 99 per cent of the conflicts between off-shore petroleum exploitation and other activities had been resolved through consultation. In the last analysis, the success of the regulatory authority would depend on the competence of its technical and professional staff.

Another important element for the Sub-Committee to consider was the provision of adequate economic incentives in any scheme of arrangements for promoting the development of marine resources. The entrepreneur must be able to sell the commodity recovered at a profit, and that largely was a function of world market prices, which were beyond the control of the Sub-Committee. It would, however, be possible to encourage entrepreneurs to explore and develop marine resources by ensuring that the conditions imposed upon them were clearly defined and would not change during the life of their titles. Fees and levies should be kept low at the exploration stage, with the accent on mankind as a whole sharing in the benefits of the production stage. In that way an operator would be encouraged to concentrate his efforts on the task of finding mineral deposits and bringing them into production. Areas leased should be large enough to allow of efficient and economic exploration, but stress must be placed on the importance of energetically and effectively working them.

Lastly, high priority should be given to obtaining accurate and detailed basic data regarding the sea-bed and ocean floor beyond the limits of national jurisdiction. At present, such data were sadly deficient.

Mr. ABDEL-HAMID (United Arab Republic) said that although the developed countries had so far made the main contribution to the Sub-Committee's discussion, the experiences of the developing countries in the exploration of the sea-bed within their national jurisdiction were a necessary ingredient for a balanced debate. It was therefore unfortunate that the developing countries had not had time to consult with their Governments, owing to the fact that the programme of work (A/AC.138/SC.2/2), which apparently applied only to the second session had not been issued until 10 March 1969, namely, at a time when the Sub-Committee had already begun its session. He hoped that the officers of the Sub-Committee would ensure that delegations had earlier knowledge of the programme of work in future.

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(Mr. Abdel-Hamid, United Arab Republic)

Turning to item 2 (a) of the programme of work, he said that his delegation considered that the establishment of the Committee on a permanent basis was in itself a very favourable factor for the promotion of international co-operation, although perseverance and mutual confidence were vital in order to widen its scope and to ensure that it took all the achievements of science and technology into account. The Sub-Committee's discussions would certainly be of value when the Main Committee came to consider item (i)(a) and item (v) of its programme of work (A/AC.138/8).

With regard to the financial agreements to be entered into with entrepreneurs, a matter which was discussed in the note by the Secretariat (A/AC.138/6), the main need was to ensure that any such agreements were equitable, since only respect for equity would promote the development of stable relations. As the Secretariat note also raised important issues that came within the field of activities of some of the specialized agencies, it was to be hoped that the representative of the Secretary-General would give thought to initiating consultations with them before the third session.

The CHAIRMAN, replying to the procedural point raised by the representative of the United Arab Republic, said that it lay with the Sub-Committee itself to decide its programme of work and that it had not been able to do so before 9 March 1969, when the Main Committee's programme of work (A/AC.138/8) had been agreed upon. Nevertheless, document A/AC.138/1, containing the Belgian delegation's suggestions for the organization of the Main Committee's work, had been issued on 5 February 1969, and its paragraph 4 B, sub-paragraphs (a) and (b), was very similar to the programme set out in document A/AC.138/SC.2/2.

Mr. GRABOVSKY (Union of Soviet Socialist Republics) said that, in spite of definite progress during the last ten years, knowledge of the sea-bed and ocean floor was still fragmentary and was insufficient to ensure completely effective economic exploitation.

The Soviet Union attached great importance to oceanographic research, as was demonstrated by the fact that more than 100 research vessels and more than 3,000 scientists of the Soviet Union were studying modern oceanographic and geophysical problems. Their research activities embraced such fields as improvement of weather forecasting, fish forecasts for industry, navigational safety, investigation of biological productivity and conservation of fish stocks, as well as the evaluation of marine mineral resources.

(Mr. Grabovsky, USSR)

In addition to its domestic research programmes, the Soviet Union was co-operating in international oceanographic research programmes. Its scientists were even now preparing a project for an expanded long-term programme of international oceanographic research. Since oceanography was a vast and complex field, involving many specialities, research would have to be conducted in many related disciplines. Some of the fundamental problems were: the interchange of matter and energy between the ocean and the atmosphere, the system of currents and its behaviour, the level of the oceans and their vertical stratification, the origin of ocean deeps and ridges, the salt content of the ocean and fluctuations in that content, pollution and the biological structure of the ocean. The programme also made provision for geological and geophysical studies - for example, research into the origin of the ocean and the formation of the earth's crust. The entire programme would be carried out with the most modern equipment. A great deal of information about tectonic structure would be gleaned from a systematic programme of taking core samples, six in the Atlantic Ocean, five in the Indian Ocean and seven in the Pacific Ocean. The problems of oceanography could be best approached through international co-operation, and the expanded long-term oceanographic research programme was being formulated with that consideration in mind.

The Soviet Union was prepared to participate in systematic research at the international level, particularly in the geological and geophysical research conducted by the Intergovernmental Oceanographic Commission of UNESCO. That Commission should be expanded in order to conduct research on marine resources, including those of the sea-bed and ocean floor. A thorough scientific study of marine resources was a necessary prerequisite for any future, economically viable exploitation of those resources.

A number of legal questions had to be settled in order to create desirable conditions for further successful oceanographic research and for the development of international co-operation in that field. One problem in that regard was a prohibition against the use of the ocean floor for military purposes.

The Sub-Committee should study ways to facilitate international co-operation in oceanographic research and the exploitation of marine resources. The chief co-ordinating agency for that co-operation should continue to be the Intergovernmental Oceanographic Commission of UNESCO.

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(Mr. Grabovsky, USSR)

The success of mankind's efforts to exploit the biological resources of the sea was menaced by pollution. The chief pollutants were oil, radioactive wastes, industrial refuse and detergents. Measures to fight pollution and preserve the biological resources of the sea should be included in any programme of international co-operation to develop marine resources.

The need to increase international oceanographic co-operation and to co-ordinate oceanographic research was an urgent one. Even the most developed country could not, alone, acquire all the knowledge that was needed about the hydrosphere of the earth, including the sea-beds and the ocean floors.

Mr. McKELVEY (United States of America) enumerated the potential ill effects of subsea mineral exploitation and measures to prevent them. Although much remained to be learnt about exploration of the deep-sea floor, experience gained in coastal waters indicated that good management would overcome most hazards. The United States had based its own regulatory procedures on its off-shore petroleum exploration experience, and it was to be hoped that other delegations, from developed and developing countries alike, would also report on their experiences.

Human safety was doubly affected by subsea mineral exploitation, since the dangers of off-shore drilling and dredging were combined with the traditional dangers of the sea. In the United States, the Coast Guard, advised by a Merchant Marine Council, maintained a Merchant Marine Safety Program and was responsible for all features of marine safety. Operations carried out from submersibles and platforms moored to the ocean bottom introduced new hazards that would have to be overcome by research in fields such as structural engineering, physiology, medicine and oceanography. Congress was currently considering regulatory legislation covering submersibles. Fixed and mobile platforms were vulnerable to storms, the effects of scouring on the sea-bed and fire from blow-outs. Regulatory authority over them was shared by state authorities and the Geological Survey. Dumps of ordnance explosives were an additional hazard to subsea mining and had caused the abandonment of a phosphorite lease off southern California.

Pollution originated from two main sources: the first was the escape of oil, gas, brines or other fluids into the sea, and the second was particulate matter which was stirred up at the sea bottom in the course of mining operations or was discharged as waste in the course of on-site beneficiation. The recent

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(Mr. McKelvey, United States)

Santa Barbara Channel oil-well leak emphasized the magnitude of the first-mentioned source of pollution. There were numerous causes of oil pollution: blow-outs during drilling; the rupture of well casings as a result of hurricanes, ship collisions or even, theoretically, earthquakes; and spillage of oil in storage or from pipeline leaks. The scale of the damage to living resources, beaches and property from a single blow-out emphasized the need for constant vigilance in drilling and other operations. Fortunately, there was already a wide range of anti-pollution equipment. For example, abnormal pressures could be controlled through the use of heavy drilling mud, well casing and automatic blow-out preventers; storm chokes could be fitted, which closed the well automatically if the well-head was broken as the result of a storm or a collision; and valves could be fitted to surface lines to shut off flow when loss in pressure indicated a leak. In addition, electronic navigation devices were being used to guide ships through unobstructed shipping lanes and to give warnings of off-shore platforms. Another task that would be facilitated by improved technology was the operation of cleaning up after oil slicks like those caused by the Santa Barbara blow-out and the foundering of the Torrey Canyon. Responsibility in the United States lay with the state authorities for off-shore activities and with the Secretary of the Interior and the Regional Oil and Gas Supervisors of the Geological Survey for drilling operations on the outer continental shelf. Private industry was making great efforts to develop and improve the safety technology already in use.

Interference with navigation was a hazard that had been largely eliminated by modern navigation aids and the establishment of sea lanes. In the United States, navigation aids were the responsibility of the Coast Guard and sea lanes the responsibility of the Corps of Engineers. Nevertheless, the increase in the number of stationary installations inevitably increased the likelihood of marine collisions and called for special vigilance on the part of crews and the maritime authorities.

The main dangers to fishing arose from the lethal effects of dynamite used as an energy source in seismic exploration and from obstructions in the form of gear or debris piles not visible from the surface which could damage trawling equipment. Fortunately, non-explosive energy sources had been recently developed for seismic exploration, and it seemed unlikely that mineral operations would interfere with fishing in deep waters. Articles 4 and 5 of the 1958 Geneva Convention on the

(Mr. McKelvey, United States)

continental shelf specifically provided for multiple use, and, in the United States, the Fish and Wildlife Service advised the Geological Survey on the issuance of exploration permits and on other problems relating to fishing.

Recreation and aesthetic values were also liable to be adversely affected by mineral exploitation near the shore. There was, however, a credit side from the balance sheet, since oil and gas platforms were said to attract fish and also served as navigational aids and emergency ports. Nevertheless the Geological Survey had laid down certain requirements in order to prevent off-shore platforms from spoiling coastal amenities.

In conclusion, it appeared that subsea mineral exploitation in coastal waters was at present subject to satisfactory control, although technological improvements in both prevention of cause and remedy of effect and improvements in fail-safe procedures that guarded against human and equipment failures were still needed. Although the danger to operating personnel was increased in deep-sea undertakings, the hazards to navigation and fishing, and losses to recreational amenities, were likely to be less. It was in the interests of marine operators to improve their safety practices and equipment, but it would remain the responsibility of Governments to set and enforce safety standards for mineral exploitation, and that function must be provided for beyond the limits of national jurisdiction.

Mr. MEYER PICON (Mexico) said that his delegation's support for the principle that the resources of the international submarine zone should be developed in the interests of all mankind had been amply demonstrated by its sponsorship of draft resolution A/C.1/L.430. The Sub-Committee's consideration of ways to exploit that zone would, however, remain somewhat theoretical until such time as the zone itself had been defined. The Sub-Committee was responsible for identifying the economic, scientific and technical factors which would serve as a basis for the Legal Sub-Committee and the Main Committee in preparing a definition satisfactory to all States.

The 1958 Geneva Convention on the continental shelf had defined the limits of the shelf over which coastal States exercised jurisdiction as the 200-metre isobath or the limits, regardless of depth, which a coastal State was technically able to exploit. Some authorities felt that modern technology had overtaken that

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(Mr. Meyer Picón, Mexico)

definition, whereas others considered that the new limit should be set at the 400-metre isobath and still others that the concept of economic exploitation by coastal States was incompatible with that of an international submarine zone. The strict application of that Convention would allow coastal States to extend their sovereign right to exploit the resources of the continental shelf to the geological limits of the shelf, regardless of depth. If, therefore, an attempt to define the international submarine zone entailed limiting the rights of coastal States under the Convention, any such limitation would have to be stated in precise geological terms and be based on the most careful scientific studies. His own country had a continental shelf comprising some 500,000 square kilometres and potentially rich in oil deposits. Obviously, therefore, his Government would closely scrutinize all matters affecting the continental shelf.

He suggested, first, that, on taking up the remaining aspects of the item, the Sub-Committee should recommend the Main Committee to give high priority to the question of the continental shelf. It might, for example, recommend that, with the full agreement of the Governments of the coastal States, accurate bathymetric charts of continental shelf areas should be prepared together with charts showing the distance between the coasts and the beginning of the continental slope, and it should recommend that exploration should be conducted as a basis for the evaluation of the resources of the areas in question. His second suggestion was that a geological definition of the continental shelf should be drawn up, possibly to complement the "working concepts" in paragraph 5 of the report of the Economic and Technical Working Group (A/7230, annex I). Those suggestions were not being made as formal proposals; he would prefer them to be reproduced in the Sub-Committee's records as opposed to being circulated as a working paper.

The CHAIRMAN, in summing up, said that, in discussing item 2 (a), delegations had once again emphasized that present knowledge was too fragmentary to permit the exploitation of the sea-bed for the maximum benefit of all mankind. Documentation on the resources of the sea-bed was felt to be insufficient and there had been a suggestion that a geological definition of the limits of the continental shelf should be prepared. As the full exploitation of the sea-bed was not yet

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(The Chairman)

possible, the international community had an exceptional opportunity to draw up advance arrangements for the development of marine resources. One representative had said that any such arrangements must be effective, credible and impartial; clearly, a high degree of technical knowledge would be required on the part of any regulatory authority enforcing them. There was also a need for stable legislative structures and economic incentives to promote the exploitation of the resources of the sea. The debate had further shown that operations in the marine environment must be conducted with a view to reducing pollution and similar harmful effects.

CONSIDERATION OF PROGRESS ACHIEVED IN THE EXPLORATION AND EXPLOITATION OF THE RESOURCES OF THE SEA-BED AND THE OCEAN FLOOR, AND THE SUBSOIL THEREOF, BEYOND THE LIMITS OF NATIONAL JURISDICTION AND IN THE TECHNIQUES USED FOR THEIR DEVELOPMENT (concluded):

(b) SURFICIAL DEPOSITS AND DEPOSITS WITHIN BEDROCK; DREDGING AND MINERAL EXTRACTION

Mr. GRANELLI (Argentina) said that technological progress in his country with regard to the extraction of hard minerals from the sea-bed had not been as rapid as that relating to hydrocarbons. His Government was still at the stage of preparing legislation to govern marine mining. It had, however, promulgated an Act to stimulate such activity by providing tax incentives. Such incentives operated at all stages in the mining process from surveying to beneficiation. There was, for example, 100 per cent tax exemption in the case of funds invested in machinery. The degree of risk involved in marine mining was such as to require the a priori establishment of legislation and tax structures to induce industrial interests to invest capital in coastal areas and thus strengthen the local economy.

As a food-producing country, Argentina was closely following international progress in the search for marine fertilizers - which had a considerable future role to play in increasing world food production.

His Government spent almost \$20 million annually on dredging operations to aid navigation. Any technological advance which could reduce such expenditure would be welcomed by the developing countries, and his Government was ready to co-operate to that end. His country also stood ready to participate in future international oceanographic expeditions studying the sea-bed and ocean floor.

The meeting rose at 12.35 p.m.

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SUMMARY RECORD OF THE SIXTH MEETING

Held on Tuesday, 18 March 1969, at 10.55 a.m.

Chairman:

Mr. DENORME

Belgium

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PRELIMINARY STUDY OF THE WAYS AND MEANS OF PROMOTING THE EXPLOITATION AND USE OF THE RESOURCES OF THIS AREA, AND OF INTERNATIONAL CO-OPERATION TO THAT END, BEARING IN MIND THE FACT THAT SUCH EXPLOITATION SHOULD BENEFIT MANKIND AS A WHOLE (RESOLUTION 2467 A (XXIII), PARAGRAPH 2 (b)); PRELIMINARY NOTE BY THE SECRETARIAT, IN ACCORDANCE WITH THE DECISION TAKEN BY THE COMMITTEE ON 7 FEBRUARY 1969)(A/AC.138/6 and Corr.1) (continued):

- (a) GENERAL CONSIDERATIONS;
- (b) ESTABLISHMENT OF BASIC DOCUMENTS

Mr. SHERMAN (Liberia) said that international efforts to promote the exploration and exploitation of the sea-bed were both important and urgent. The development of the sea-bed in the interest of all mankind was the last field of endeavour in which developed and developing countries could alike participate. It had been argued that such international co-operation would discourage the few developed countries possessed of the necessary technological capacity and finance from exploring the sea-bed and ocean floor unilaterally for their own purposes. His delegation believed that such a competitive spirit would be attenuated by a united endeavour, especially as the areas in question were, like the high seas, the common property of all.

His delegation felt strongly that the Main Committee should recommend the Assembly to adopt a systematic plan for the utilization of the area. One step in promoting international co-operation could be an appeal to the developed States to make a concerted effort to assist in the training of technicians from developing countries so that the latter could contribute to research and exploration on an equitable basis. Furthermore, as the Sub-Committee could scarcely prepare useful basic documents without a detailed knowledge of the results of the exploration of the sea-bed to date, his delegation hoped that countries, and organizations of whatever kind, having topographical and geological charts of the sea-bed and other pertinent data would make them available. The achievements of the recent Apollo 9 flight were an example of the way in which developed countries might add to the scanty knowledge and documentation at present available.

His delegation realized that the achievement of understanding with regard to international co-operation in the development of the sea-bed and ocean floor would

(Mr. Sherman, Liberia)

be no easy matter. As the preliminary note by the Secretariat rightly pointed out, measures should be devised whereby all countries, sea-bound or land-locked, might benefit from marine mineral resource development, with the interests of the developing countries being safeguarded.

Mr. ODA (Japan) expressed his delegation's appreciation of the very useful information given by previous speakers with regard to progress achieved in the exploration and exploitation of the resources of the deep ocean floor. As there might well be a close relation between the discussions in the Economic and Technical Sub-Committee and those in the Legal Sub-Committee, which was considering various legal principles in the context of General Assembly resolution 2467 A (XXIII), he felt quite strongly that there should be some co-ordination between the two Sub-Committees. He trusted that suggestions made in the course of the Economic and Technical Sub-Committee's work which had a bearing on legal or institutional aspects of the development of the sea-bed would not prevent the Legal Sub-Committee from discussing the relevant issues freely. He thought that the Economic and Technical Sub-Committee might profitably indicate to the Legal Sub-Committee or the Main Committee sources of information which could serve as a basis for their debates without, however, depriving them of the possibility of suggesting whatever international régime or machinery might be appropriate for them.

The CHAIRMAN recalled that the Chairman of the Main Committee had pointed out that some overlapping in the work of the two Sub-Committees could hardly be avoided. He himself was well aware of the need for co-ordination in the work of the two Sub-Committees, and the officers of both had already begun consultations.

Mr. SULEIMAN (Libya) said that his country, with a coastline of some 2,000 kilometres, could hardly remain indifferent to the prospects inherent in the latest developments in the exploration and exploitation of marine resources. It was fully aware of the complexity of the problems involved as it was of the danger of allowing those resources to be exploited in the absence of an appropriate judicial structure which would safeguard the legitimate interests of all countries and would, in its turn, serve as a foundation for the preparation, without further delay, of the institutional structure necessary for the orderly management of the

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(Mr. Suleiman, Libya)

marine environment beyond the limits of national jurisdiction. His delegation would again emphasize that marine resources must be exploited for the benefit of all mankind and that there must be appropriate international machinery to supervise such exploitation. He hoped that the Secretary-General's report on the question of establishing such machinery would be made available as soon as possible, for the establishment of that machinery was the first task to be undertaken.

International scientific activity should concentrate on certain major issues, the first being the acquisition of a fuller knowledge of the sea-bed and the marine environment in general. International co-operation and co-ordination with regard to topographical and geological research must therefore be improved. Another priority was the promotion of international co-operation in the prevention and control of pollution and other harmful effects of activity on the sea-bed. Particular attention should be given to the conservation of marine fauna and preservation of the biological and chemical balance of the ocean. Pollution by radio-active materials must also be controlled. There should be greater efforts to obtain more detailed information on the economic and commercial viability of the exploitation of marine resources and on its possible implications for world markets and prices.

Mr. PAVICEVIC (Yugoslavia) said that his delegation had been keenly interested in the very informative statements of previous speakers concerning the considerable technological progress which had been achieved in all areas of marine exploration. The results obtained by the research ship Glomar Challenger and the construction of large semi-submersible drilling platforms in Canada were two examples of such progress, which was making possible the exploration and evaluation of marine mineral deposits at ever-greater depths. There had been significant progress in all stages of the exploitation of hydrocarbon deposits, and many countries were now engaged in off-shore petroleum production. Government and private investment for the prospecting of hard-mineral deposits was also growing rapidly, and that was a significant development, for it indicated that the marine environment was not an obstacle to the commitment of funds.

The United States delegation had referred to the possible economic and technological feasibility of exploiting mineral deposits at even greater depths if large deposits of valuable minerals were found. Present knowledge indicated that the economic soundness of investment in the exploitation of marine mineral deposits

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(Mr. Pavićević, Yugoslavia)

would eventually be recognized. Thus, there was every encouragement for the establishment of an international régime to regulate the exploration and exploitation of marine resources beyond the limits of national jurisdiction.

The international community was tending towards the creation of a new kind of régime which would be based on principles, criteria and standards that would automatically give all countries not only equality in opportunity but equality in actual enjoyment of benefits derived from the riches of the marine environment. The marine environment differed in many ways from conditions on land. It was a region which did not belong to any particular State but was the heritage of all mankind. Thus, in its approach to the whole issue, the international community's goal should be to exploit the sea-bed in an orderly manner in the interests of all, with due account being taken of the needs and interests of the developing countries.

His delegation therefore suggested that the principle of the exploitation of the marine environment for the benefit of all should be elaborated from every point of view - legal, economic and so forth. It would be of great benefit to the Sub-Committee's work if the Secretariat were to prepare a study of that question for its next session. Various land-based systems associated with mineral exploitation - such as leases, tax structures, registration procedures and so on - would have to be examined in the context of the new régime for the exploitation of the marine environment.

The elaboration of the new régime must proceed with caution, but also with speed. For that reason, his delegation was somewhat concerned at the varying degrees of progress being made towards a solution of related problems which characterized the work of the two Sub-Committees. The early adoption of a declaration of general principles relating to the marine environment beyond the limits of national jurisdiction was of considerable importance to the work of the Economic and Technical Sub-Committee. If, for example, the leasing system for the exploitation of marine resources was not based on a codified concept of exploitation for the benefit of all, the final outcome could be a situation in which such resources were claimed, registered and exploited by the richer countries. Among the many questions to be answered in the elaboration of that concept was that of the degree to which profits would be distributed.

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(Mr. Pavićević, Yugoslavia)

The preliminary note by the Secretariat (A/AC.138/6) was interesting, and its approach to the four phases necessary for the development of marine mineral resources was practical. His delegation considered that discussion of all four phases should be based on the goal and principle of exploitation of marine resources for the benefit of all. Consequently, the developing countries - as the States which would be most dependent on the international régime eventually adopted - must participate actively in all four phases. While the problems relating to the third and fourth phases were the more complex, the first two phases - the establishment of basic documents and the exploration of mineral concentrations - would be accomplished through international co-operation at the present time. He referred to the expanded programme of scientific exploration of the oceans and the decade of ocean exploration as its important element. The value of those efforts would be measured by how much in practice they enriched knowledge of all countries about the oceans. Information resulting therefrom could provide the necessary elements for the accomplishment of the first two phases.

With regard to item 2 (b), he pointed out that as it was already possible to exploit the natural resources of those parts of the ocean floor which were situated at depths ranging from a few metres to 200 metres, such submarine formations should be thoroughly investigated, and the details of any deposits in them should be made available to all countries as soon as possible.

Mr. GRANELLI (Argentina) said that he would address his comments to the five basic issues which most delegations agreed in regarding as important.

The first was the issue of scientific co-operation at the regional level. As regional activities should be concerned with exploring and evaluating the resources of the sea-bed and the ocean floor, including those locked in the earth's crust, regional oceanographic research would be greatly assisted by the provision of the necessary equipment and the encouragement of local research efforts. Particular attention should be given to the training of national scientific personnel and to ways of preventing their subsequent exodus to other, perhaps more scientifically advanced, countries.

Secondly, international scientific co-operation, however worth while it might be, was often beyond the financial means of the developing countries. Even where they did have the financial means, skilled oceanographers, geophysicists, geologists and marine biologists were in extremely short supply. Thus, it was important to assign a high priority to the training of scientific personnel.

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(Mr. Granelli, Argentina)

Thirdly, freedom of exploration must be preserved. With due allowance for the protection of national sovereignty over the continental shelf, oceanographic research should be unhampered and its results made available to all.

The fourth issue was the urgent problem of defining the "continental shelf". The representative of Mexico had suggested that a scientific study should be undertaken to arrive at such a definition, which would, of course, also be of great value to the Legal Sub-Committee.

The fifth issue, the problem of pollution, was extremely important. The efforts of the International Atomic Energy Agency and the Inter-Governmental Maritime Consultative Organization to combat pollution should be extended to the sea-bed and the ocean floor.

The CHAIRMAN gave the floor to the representative of Venezuela to speak in his status as an observer.

Mr. REINALDO FIGUEROA (Venezuela) said that the fundamental objective of any scheme to promote the development of the resources of the sea-bed and ocean floor should be to meet the development needs of the international community. A large part of whatever rewards accrued from the exploitation of that area should be devoted to bridging the gap between the developing and developed countries. The development of those resources should be undertaken within the framework of the global development strategy envisaged for the second Development Decade.

He hoped that, in its recommendations to the Main Committee, the Sub-Committee would favour a broader approach to co-operation at the international level and would oppose the attempts of private interests to gain exclusive control over marine resources. In that connexion, he applauded the policy of the United States Government, as stated by President Johnson in 1966, to view the resources of the sea-bed and ocean floor as the common heritage of mankind.

Guided by the Secretariat's preliminary note (A/AC.138/6 and Corr.1), the Sub-Committee should suggest technical and economic arrangements which would minimize the possibility of conflict in the exploitation of resources in the area under consideration.

The United States representative was justifiably concerned over the dangers of pollution in connexion with the exploitation of marine resources. Venezuela

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(Mr. Reinaldo Figueredo, Venezuela)

had had experience with pollution problems in connexion with the exploitation of petroleum resources in the Maracaibo area. However, such problems were relatively less important than other matters being considered by the Sub-Committee.

The Sub-Committee should devote special attention to the task of indicating how marine resources might be exploited for the benefit of mankind as a whole, with particular regard for the needs of the developing countries. It might wish to consider how such natural resources should be developed and what means would best ensure the conservation of non-renewable resources. The experience of many countries had shown that service contracts, which were coming to be more and more widely used, could be more effectively adapted to operations concerned with the exploitation of marine resources.

Some sort of international machinery would be helpful in promoting the exploration and exploitation of the sea-bed and ocean floor beyond the limits of national jurisdiction. It might do so directly or in association with public or private agencies. Whatever arrangements were made, the aim must be to attain the highest possible degree of co-operation.

Mr. FENESAN (Food and Agriculture Organization of the United Nations) said that FAO was following the Committee's work with great interest and was particularly interested in the Sub-Committee's concern to maintain the biological balance of the sea-bed and ocean floor and to avoid damage to marine fauna. His agency had had extensive experience of the conservation of biological resources, and its Director-General had repeatedly stated his willingness to contribute to any international efforts in that field. Similarly, FAO would be happy to make any contribution within its ability to the work of the Sub-Committee.

The CHAIRMAN, commenting on the discussion with regard to the item under consideration, noted that attention had been drawn to the problem of increasing scientific knowledge of the sea-bed and ocean floor beyond the limits of national jurisdiction. A suggestion had been made that some international arrangement should be devised to encourage the training of specialists in oceanography and related disciplines. Various members of the Sub-Committee had discussed possible international arrangements to promote the development of marine resources and had

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(The Chairman)

emphasized that new regional forms of co-operation should be sought. The dangers of pollution and the conflicts which might arise between various uses of resources had been pointed out.

In line with the Sub-Committee's standing practice, he requested the representative of Liberia to submit a formal text of his suggestion so that the Sub-Committee might be able to consider it at a later meeting.

The meeting rose at 11.50 a.m.

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SUMMARY RECORD OF THE SEVENTH MEETING

Held on Wednesday, 19 March 1969, at 10.50 a.m.

Chairman:

Mr. DENORME

Belgium

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PRELIMINARY STUDY OF THE WAYS AND MEANS OF PROMOTING THE EXPLOITATION AND USE OF THE RESOURCES OF THIS AREA, AND OF INTERNATIONAL CO-OPERATION TO THAT END, BEARING IN MIND THE FACT THAT SUCH EXPLOITATION SHOULD BENEFIT MANKIND AS A WHOLE (RESOLUTION 2467 A (XXIII), PARAGRAPH 2 (b); PRELIMINARY NOTE BY THE SECRETARIAT, IN ACCORDANCE WITH THE DECISION TAKEN BY THE COMMITTEE ON 7 FEBRUARY 1969) (A/AC.138/6 and Corr.1) (continued):

(b) ESTABLISHMENT OF BASIC DOCUMENTS

The CHAIRMAN expressed the Sub-Committee's gratitude to the United States delegation for having invited Dr. Maurice Ewing to make a presentation with slides on the exploratory work of the Glomar Challenger. His presentation had been most informative.

Acting upon the suggestion of the United Arab Republic representative, he had prepared a draft programme of work for the third session which he now submitted to the members of the Sub-Committee for their written comments and suggestions.

Mr. ABDEL-HAMID (United Arab Republic) said that while the potential resources of the ocean floor had been computed on the basis of existing knowledge and theory, the amount of specific data on the marine environment was minute by comparison with the extent of the world's oceans.

In considering the problem of establishing basic documents, one question to be answered was whether or not priorities could be devised in the choice of areas to be studied. His delegation wondered whether it would be possible to give priority to areas close to the continental shelf yet beyond the limits of national jurisdiction and to areas where there were indications of potential mineral deposits.

A second question was how basic documents were to be made available to the international community. It was obvious that the United Nations system should make arrangements to undertake that task. As, however, the Intergovernmental Oceanographic Commission (IOC) was to inform the Sub-Committee as to the commitments which it could assume, his delegation would refrain from further comment on that aspect of the matter.

His delegation's understanding was that the basic documents to be established in respect of the marine environment were documents other than those already widely available. He wondered whether the major Powers could be asked to disclose oceanographic information in their possession on a voluntary basis. The disclosure

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(Mr. Abdel-Hamid, United Arab Republic)

of such information would certainly be conducive to mutual trust; such action would also help to safeguard the interests of mankind as a whole and, consequently, the orderly development of the marine environment. The registration with the United Nations Secretariat of oceanographic activities undertaken beyond the limits of national jurisdiction by nationals of States Members of the United Nations would be one step towards the wider dissemination of information. He assumed that the establishment of basic documents would be carried out by suitably qualified experts. The staff of the relevant units of the Secretariat should accordingly be strengthened.

With a view to accelerating the establishment of basic documents, the Sub-Committee should explore the possibility of regional co-operation through the regional economic commissions. In that connexion, paragraphs 74 and 76 of the report of the Economic and Technical Working Group (A/7230, annex I) were especially relevant. Such co-operation would be very helpful in the preparation of basic documents on mineralization zones and would certainly contribute to the identification of priorities for further exploration and exploitation. Attention should also be given to the organization of seminars and training programmes for experts in order to further oceanographic activities at the regional level.

Miss MARTIN SANE (France) said that many valuable points concerning the development of marine resources were made in the preliminary note by the Secretariat (A/AC.138/6 and Corr.1), although the division of marine mineral resources development into four phases was somewhat arbitrary. There was a certain overlapping, for example, between the exploration and the evaluation phases.

The first phase, the establishment of basic documents, was an obvious necessity for determining the location of mineral resources on the sea-bed and ocean floor. Serious efforts were at present being made to prepare marine topographic and geological maps, but those efforts needed to be intensified and, in particular, extended to the area of the deep ocean floor. It was important in that connexion to standardize sampling and analytical techniques because information gathered by different methods and with different systems of instrumentation was difficult to compare. One way to develop a standardized methodology would be to carry out an international project - perhaps within the framework of the International Decade of Ocean Exploration - to survey a strip of the ocean floor,

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(Miss Martin Sane, France)

of 100 nautical miles in width, extending from one side of the Atlantic Ocean to the other. Such a project would of necessity be an international undertaking, since no single State commanded the resources to carry it out alone.

Having participated in international oceanographic research, her country felt strongly that international co-operation in that field should be broadened. The task of co-ordinating such co-operation should be entrusted to the Intergovernmental Oceanographic Commission of UNESCO. While other international organizations, both within and without the United Nations family, should actively participate in oceanographic research, IOC should serve as a central co-ordinating body and as a clearing-house for information on research activities undertaken by States and international organizations.

In its capacity as a central clearing-house for information, the IOC should solicit all pertinent data from States, international organizations and private enterprises engaged in oceanographic research, and the information thus obtained should be made available on as wide a basis as possible to all those needing it.

As a beginning, IOC should formulate an over-all programme of oceanographic research, defining the areas to be investigated, the kinds of data to be gathered and the methodology to be used. The IOC could indicate areas to be investigated on a priority basis with particular attention to promising zones of mineralization. It would, of course, be for Governments to decide whether or not to follow the recommendations of IOC.

Mr. TRACEY (United States of America) said that basic documents, and especially regional topographic and geological maps, laid the groundwork for identifying potential marine mineral resources. They also helped to determine the nature of bottom sediments and the underlying bedrock. That information was important for designing structures to be placed on the ocean bottom, for predicting possible hazards to bottom operations and for assessing the consequences of disturbing sediments during exploitation. It was important to note, however, that such basic maps were not sufficient in themselves to guide exploration for specific mineral deposits. For that, far more detailed studies were necessary.

Three principal kinds of maps were relevant to the development of marine resources: topographic maps, showing bottom depth and the shape of features by contours; bottom sediment maps, showing the kinds, distribution and thickness of surficial sediments; and geological maps of the bedrock beneath the sea. The information for topographic maps was obtained by fathometers that recoded depth /...

(Mr. Tracey, United States)

profiles along the ship trackline. From many such tracks, laid out in an intersecting pattern over a single area, bottom contours could be established. Present-day maps were considerably more accurate than those prepared a decade ago because of the increased precision of navigational equipment. Piston corers, boomerang corers, grab samplers and dredgers provided the information required for bottom sediment maps, while geological maps were based mainly on magnetic, gravity and seismic surveys. Continuous seismic profiling had come to be an effective and widely used method of obtaining geophysical information. Maps could be prepared either on a regional scale to show general features over large areas or on more detailed scales to show intricate local relations.

The world-wide reconnaissance work of the Glomar Challenger was a pioneering effort that would enable geologists to define the geological character and the sedimentary history of many major areas of the oceans. Although much was still to be gained from exploratory traverses, such as those being made by the Glomar Challenger, the time was approaching when it would be desirable to choose specific areas to investigate in more detail.

A scale of 1:1,000,000 was reasonable for reconnaissance mapping of moderately large areas. To map an area of 1,000,000 square kilometres would require at least 200,000 kilometres of ship trackline. The tracks would be spaced five kilometres apart and thus would obviously be too wide to reveal all the bathymetric detail. Inasmuch as the area of the ocean was 362 million square kilometres, it had the areal equivalent of 362 maps of that size and scale. Plainly, even the most fundamental mapping of so large an area represented an enormous undertaking.

The United States Geological Survey was presently engaged in a programme of regional geological mapping of the United States continental margin. The investigations off the Atlantic Coast were the most complete and would furnish the best example of the complex problems of mapping a large region. The Atlantic programme had been begun in 1962 as a joint endeavour of the Geological Survey and the Woods Hole Oceanographic Institution. The purpose of the investigation had been to obtain a regional understanding of the Atlantic continental margin, an area relatively well known because of previous studies. Topographic maps on a scale of 1:1,000,000 had been prepared on the basis of information already available. About 20,000 kilometres of continuous seismic profiling had been undertaken to show the sediment thickness and shallow structure of the rock formation of the shelf. More than 2,000 sediment samples had been collected, each sample accompanied by a picture of the bottom area. Outcropping rocks in critical areas had been sampled, and six core holes had been drilled across the Florida Shelf and the Blake Plateau to a maximum depth of 1,000 feet below the sea floor. More than a hundred

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(Mr. Tracey, United States)

scientific papers had been published on the geology and the biology of the Atlantic Continental Shelf as a result of that investigation. The programme had achieved a reasonable understanding of the area at a reconnaissance scale, and deposits of manganese, phosphate, sand and gravel, as well as potential sources of petroleum, had been identified.

He stressed that the investigations he was describing had been general-purpose geological studies aimed at discovering conditions affecting the use and conservation of all resources. They had not been made solely to find economically viable sources of minerals. For example, one aim of the programme had been to gather material for biological studies which would in turn provide a basis for ecological studies relating to commercial fisheries. Also, the information on bottom sediments would assist in predicting the possible adverse effects of their disturbance on nearby fisheries.

Several areas of the major coastal regions of the United States were being investigated and mapped at an intermediate scale of 1:250,000. A fifteen-year programme was proposed by the Environmental Science Services Administration to map the bathymetry, magnetics, gravity and sediment thickness of the entire continental margin - an undertaking that would require seventy ship-years of work - and a twenty-year programme had been proposed by the Geological Survey to map the geology. On land, that scale would be called regional or reconnaissance mapping; most geological mapping on land was done at scales of 1:50,000 or 1:10,000.

The United States experience might lead to conclusions relevant to the general problem of mapping the sea-bed beyond the limits of national jurisdiction. The scale of 1:1,000,000, which had been used for mapping the deep ocean, should be considered for universal coverage, although many areas might not need to be mapped at that scale. Systematic geological mapping of the deep ocean-floor was still in the embryonic stage, and it was difficult to anticipate its complexity. It was to be hoped that the geology of the deep ocean would prove to be less complex than that of the coastal regions. For practical purposes, there would be less need for knowledge about the geological structure of sediments and bedrock in many parts of the deep ocean than on the continental shelf. The observations taken as the basis for geologic mapping would be more widely spaced than would ordinarily be called for at a scale of 1:1,000,000. Since the cost of deep-sea work was certain to be greater than that of work carried out in shallower water, and because the area to be mapped was so large, it was plain that the task of deep-sea mapping would be a long and expensive one. The magnitude of the problem, however, should not give

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(Mr. Tracey, United States)

rise to discouragement, for even most of the complex land areas of the world had not yet been adequately mapped. It was important to recognize that resource development did not have to await the completion of mapping. In the long run, however, the base for the full and effective use of the sea-bed would be laid by systematic mapping, just as was the case on land.

Mr. LIVERMORE (Australia) said that a realization of its inadequate knowledge of its geological structure had led Australia, at the end of the Second World War, to set up a Bureau of Mineral Resources. Despite concentrated efforts, however, the Bureau's staff of 700 scientists and experts had not yet completed a survey which was supposed to cover 3 million square miles, and it was clear that a complete survey of the sea-bed, an area of 140 million square miles, was an immense task. Nevertheless, complete surveys of the whole sea-bed did not have to be completed before mineral exploitation could begin.

With reference to paragraph 14 of the note by the Secretariat (A/AC.138/6), his delegation considered that priority should be given to areas where preliminary exploration had been encouraging and that water depths, marketability of minerals and prevailing weather conditions were also factors that should be taken into account.

Since there had been general support for the proposition that the results of government and academic research in areas of the sea-bed beyond the limits of national jurisdiction should be freely available to all, his delegation suggested that entrepreneurs who were granted a concession to explore an area for a specified period with the right to exploit any discovery should be required to publish, possibly after the lapse of a certain period of time, basic data on such matters as seismic records and on cores, cuttings and samples obtained in the course of exploration. Such a requirement was a condition of oil exploration subsidies given by the Australian Government, which had fixed six months as the period after which data would be made available to any one who desired it. An example of the benefits of that sort of arrangement was the recent discovery in Queensland of a major phosphate deposit which had resulted from a detailed examination of cores taken by oil companies in an area that two leading United States geologists had recommended as being a likely source of phosphate.

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Mr. FLEMING (United Kingdom) said that co-operative planning and execution, freedom of the practice of research and freedom of exchange of information were the three main elements in furthering the scientific establishment of basic documents.

Since the sea and the sea-bed were continuous elements, with only indistinct natural boundaries between regions, and since data had to be collected over a very wide area for a proper understanding of large-scale geology or oceanography, it was common practice for survey ships from two or more nations to co-operate in the conduct of research activities so that a complete picture of the physical situation could be obtained. The enthusiasm for such co-operation could be seen in the response to the proposals for an International Decade of Ocean Exploration and the expanded programme of IOC. A prerequisite to international co-operation was the combined planning of scientific experiments, including the standardization of instruments, measuring techniques and data-processing methods. Sufficient personnel and basic facilities must be available after an expedition in order to process, publish and exchange data and to produce an effective series of reports. Such work might take as long as five years, as in the case of the Indian Ocean expedition of 1964.

Scientists were now beginning to discuss plans for combined surveys of the continental shelf of the eastern Atlantic Ocean from the Arctic to the south Atlantic and of the Mediterranean and the Caribbean Seas. Also, the standardization of instruments was becoming a matter for very serious attention. In February, the United States had set up a National Instrumentation Center to ensure that instruments used in United States laboratories could be tested and calibrated to an identical standard. The United Kingdom supported the suggestion made at the recent conference by the head of that institution that an international centre should be set up for the same purpose.

Freedom of research was a vital element because, although Governments naturally promoted projects which appeared economically attractive, scientists were often intellectually committed and totally dedicated to the solution of a certain problem regardless of its cost or economic benefit. Past attempts to restrict scientists' freedom of research had always had disastrous effects on their achievements. It followed that when scientists on oceanographic vessels

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(Mr. Flemming, United Kingdom)

were carrying out pure research into the basic nature of the sea or the sea-bed without any immediate economic objectives, no restrictions should be placed on the movement of such vessels. Indeed, the 1958 Geneva Convention provided for freedom of research with the provision that cruises in coastal waters should be notified to the coastal State in advance and that if a coastal State wrongly interpreted that clause in a restrictive way, it would undermine the scientific basis upon which future progress depended for all countries.

The third element was the freedom of exchange of information, such information consisting in the present case of: cores and samples; maps, charts and profiles; tables of correlated variables; punched tape, magnetic tape and magnetic discs. It was common for marine researchers to share geological and biological material, and there was, for instance, a centre in Tunisia from which samples taken in the Mediterranean were distributed to scientists in other countries. Similarly, the cores collected by the Glomar Challenger would be sectioned for the same purpose.

It was likewise a common occurrence for Governments to insist that cores and well-logging data of general scientific interest, but without special commercial value, should be made available to the relevant national geological institute for publication after a time lapse of a few years. A similar system might be established for the non-national area of the sea-bed, and publication might be in the form of printed media or might be effected through the exchange of tapes and discs. One difficulty was that the interpretation and processing of data for publication or retrieval was an extremely rare skill, and it was not uncommon for information communicated by commercial companies not to be interpreted and published by Governments through lack of scientists with the time to do the work.

The storage, processing and retrieval of data did, of course, represent a most important factor and both the United States and the United Kingdom had national oceanographic data centres which were standardizing the methods of data storage so that data would be permanently and swiftly available to scientists everywhere. Although in the United Kingdom and elsewhere computers were coming into wider use for the processing of oceanographic data, and although world oceanographic data centres were operating in Washington and Moscow, there was as yet no world-wide system for handling applied science data and technological and industrial information about the sea. A first step in such a project would be the preparation

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(Mr. Flemming, United Kingdom)

of a multilingual terminology bulletin from which an information classification and retrieval system could be derived. His delegation thought that such a project was feasible and that it should be launched in the near future.

The United Kingdom was already putting into practice, although perhaps in a small way, the interesting suggestion by the Liberian representative that increased training should be offered to marine scientists from the developing nations.

In reply to points that had been raised by the representative of the United Arab Republic and other representatives, he said that marine scientists in the United Kingdom were concentrating their efforts on the continental shelf and that in view of the technological progress being made in scientific research, areas of priority should be first in the margins and later in deeper water. Maps of the areas most likely to contain mineral deposits were already in existence, and the best general policy was to back success.

Although it was true that details of cruise programmes were not available to the United Nations Secretariat, a large number had been discussed at meetings of IOC.

It would be impossible to make the results of oceanographic research available through conventional methods because the millions of words and figures that would be needed would require a mountain of paper and enormous expenditure. Computer storage, using tapes and discs, was the only possible solution, but it would call for greater numbers of skilled staff to interpret the data.

Mr. MLADEK (Czechoslovakia) said that it was apparent from the interesting statements which had been made in the Sub-Committee that the technological gap between developed and developing countries in oceanography had widened. He was therefore in favour of assistance being granted to the developing countries to enable them to take a more active part in the exploitation of the sea-bed. Although a land-locked country, Czechoslovakia had a real interest in the sea-bed as a source of raw materials and intended to take an active part in exploration and exploitation activities as it would be a great help if a survey of publications containing the results of sea-bed research and exploitation could be prepared by IOC, the Sub-Committee should recommend the Main Committee to make such a request.

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(Mr. Mladek, Czechoslovakia)

With regard to the question of priorities raised in paragraph 14 of document A/AC.138/6, his delegation believed that Member States should agree on certain areas for which topographic and geological maps would be prepared. It hoped that the Mediterranean would be one of the areas so chosen. It would also be of great assistance to the world community if UNESOC could establish a register of existing maps and other agreed basic documents containing the name and address of the organizations possessing the documents. Publication of new documents should be regularly communicated to UNESCO for inclusion in the register.

Mr. OLISEMEKA (Nigeria) said that the excellent preliminary note by the Secretariat (A/AC.138/6) indicated that the establishment of basic documents was the first phase in any programme for the development of marine mineral resources. As, however, the documents would be of very limited value in the absence of trained personnel able to make use of them, the first priority should be the training of experts who could both prepare basic documents and put them to the best use. The availability of such skills could not be taken for granted; the education and training of oceanographic specialists, even on a limited scale, was of paramount importance and should be accorded the priority it deserved.

It was encouraging to note from document A/AC.138/10 that the need for effective documentation was clearly recognized by IOC. That document mentioned mapping and charting; the observation and prediction of ocean and atmospheric conditions; data processing and dissemination; the training and education of specialists, and the development of ocean engineering. His delegation would like once again to emphasize that main priority should be accorded to the education and training of specialists, since that was the mainspring of the other activities.

The Sub-Committee should also promote a positive concept of international co-operation. Such co-operation meant much more than the passive reception of impressive and esoteric documents; it meant being intimately involved from the outset in scientific research programmes and all phases of oceanographic ventures.

His delegation had noted with interest the steps being taken by IOC to contribute to the development of the existing programmes. However, the fact that only twenty-two countries appeared to have responded positively to those efforts was an indication of the degree of further effort required if international

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(Mr. Olisemeka, Nigeria)

co-operation was to become a reality. His delegation would welcome concrete proposals for encouraging such co-operation. It wondered, for example, what facilities were available for effective scientific research within the framework of international arrangements, how far the pooling of oceanographic knowledge was possible, and what efforts were being made to associate the developing countries in a positive way with existing programmes. It would, moreover, like to know how much effort had been made at the international level to draw the attention of Governments, particularly those of the developing countries, to the limitless possibilities of the sea-bed.

His delegation appreciated the degree of co-operation existing between IOC and Member States, and between IOC and other United Nations bodies. Obviously, however, there was room for further improvement. He noted in that connexion that consideration was currently being given to the establishment of an inter-agency committee to harmonize existing scientific programmes, but such measures could be no substitute for a rationally planned international arrangement within the framework of which the essential work of training, research, the pooling of knowledge, the processing of data, the compilation of documents and the exploitation and use of the sea-bed would be ordered for the benefit of mankind as a whole with due regard for the interests of the developing countries.

The CHAIRMAN, commenting on the debate, said that the systematic study of the marine environment - a considerable, time-consuming and costly undertaking - had scarcely begun. It was felt that the study should not be confined to a search for economically exploitable sources of minerals but should be extended to all phenomena of the marine environment. It was a task requiring international co-operation, particularly with regard to a co-ordinated, long-term programme of oceanographic research, and, in that connexion, the co-ordinating role of IOC had been stressed. Such a study also supposed the standardization of sampling equipment and methodology. It was felt that the study should be subject to the principle of the freedom of scientific research and that its results should be disseminated as widely as possible. Some delegations had asked that a central register of oceanographic activities should be established. The active participation of all Governments in the study had been urged, and it was thought that priority should

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(The Chairman)

be given to the training of marine scientists. The debate had also shown that the exploitation phase would begin before the comprehensive charting of the abyssal plain had been completed. It further appeared that the time was approaching when a choice of marine zones to be prospected in detail could be made. The preliminary note by the Secretariat (A/AC.138/6) raised the question of whether or not certain priorities could be devised in the choice of areas for which the establishment of basic documents would be promoted. Several delegations had felt that priority should be given to the selection of basic data on areas with an economic potential for exploitation. As to the question of how basic data should be made available to the international scientific community, he pointed out that centres were already in existence in Moscow and Washington for the storage and interpretation of oceanographic data. Furthermore, any arrangements giving exclusive rights to concessionaires to exploit marine resources should include provisions requiring them to publish, after a given lapse of time, any data obtained during their operations.

The meeting rose at 12.30 p.m.

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SUMMARY RECORD OF THE EIGHTH MEETING

Held on Thursday, 20 March 1969, at 10.55 a.m.

Chairman:

Mr. DENORME

Belgium

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PRELIMINARY STUDY OF THE WAYS AND MEANS OF PROMOTING THE EXPLOITATION AND USE OF THE RESOURCES OF THIS AREA, AND OF INTERNATIONAL CO-OPERATION TO THAT END, BEARING IN MIND THE FACT THAT SUCH EXPLOITATION SHOULD BENEFIT MANKIND AS A WHOLE (RESOLUTION 2467 A (XXIII), PARAGRAPH 2 (b); PRELIMINARY NOTE BY THE SECRETARIAT, IN ACCORDANCE WITH THE DECISION TAKEN BY THE COMMITTEE ON 7 FEBRUARY 1969) (A/AC.138/6 and Corr.1) (continued):

(c) EXPLORATION OF MINERAL CONCENTRATIONS;

(d) EVALUATION OF MINERAL CONCENTRATIONS OR DEPOSITS WHICH HAVE BEEN ASCERTAINED: TECHNICAL FEASIBILITY AND ECONOMIC EXPLOITABILITY

Mr. McKELVEY (United States of America) gave the Sub-Committee an account of the origin, incidence, effects and means of prevention and control of oil-well blow-outs. He introduced his remarks by informing the Sub-Committee that two wells, one gas and one oil, had gone out of control the previous week-end in Louisiana waters in the Gulf of Mexico. A heavy storm had shifted the drilling barge and broken the fittings at the well-heads, causing loss of control. Neither was a blow-out in the proper sense, and while that did not reduce the potential damage from the release of fluids, it might make them easier to bring under control.

Blow-outs were a general problem in petroleum exploitation and were one of the principal concerns of Governments in the exploration phase of the resource development process. That problem was therefore closely related to agenda item 2 (c).

As applied to oil and gas wells, the term "blow-out" had a much more literal meaning than in some of its other uses, for it described the sudden, sometimes explosive, release of gas or oil from a well that had penetrated a stratum containing oil and/or gas under high pressure. A blow-out could also be caused by the release of ground water or geothermal steam, but, despite the frequent occurrence of such fluids at high pressure, blow-outs were comparatively rare.

Procedures existed to warn operators of potential blow-outs, to prevent them from occurring and to prevent the well from going out of control after a blow-out.

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(Mr. McKelvey, United States)

Only twenty-three blow-outs had occurred in 7,642 wells drilled up to 31 January 1969 in the outer continental shelf of the United States, and only the Santa Barbara well had resulted in significant environmental damage. The explanation for the infrequency of blow-outs lay in the fact that fluids encountered in drilling were put under reverse pressure by the weight of the mud kept in the well-bore during drilling.

Of the twenty-three blow-outs that had occurred, only three were of oil alone and two others, including the Santa Barbara well, were of oil and gas. Fire was therefore the major hazard and had been the main cause of the disaster at the Little Bob drilling rig in August 1968.

Cratering beneath the rig was another hazard of blow-outs and occurred when soil and rock were torn loose and carried out by what might amount to a jet stream. Development of such a crater might cause the rig to topple over or sink, with a resulting loss of life and a further loss of control of the well.

Control of the Santa Barbara oil slick had taken several forms: physical collection of the oil at sea and on the beaches; the laying of log and plastic booms to contain the oil within a given area and prevent its entrance into marinas and the like; and degradation through the use of chemical dispersants and talc. Although substantial damage had been caused to marine life and amenities, the total volume of oil spill had amounted at the most to 6,000 barrels, which was an insignificant amount in comparison with the 700,000 barrels spilt in the Torrey Canyon wreck. With super-tankers under construction capable of carrying 2 million barrels or more, the gravity of the problem was obvious.

The rupture of the casing at the two well-heads in the Gulf of Mexico on the previous week end had been similar to the storm breaks caused by hurricanes in the past. Although automatic storm-checks were mandatory, they were not fool-proof. The procedures for regaining control in such cases were similar to those for blow-outs, but because such wells were already cased, it was generally possible to cap or plug them without resorting to the mud techniques which were sometimes required to kill blow-outs.

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(Mr. McKelvey, United States)

The United States Government had initiated a comprehensive investigation of the Santa Barbara disaster and was reviewing its off-shore drilling regulations in the context of oil and gas development plans. Mr. Walter J. Hickel, the Secretary of the Interior, had already placed greater responsibility on operators for ensuring that the rare phenomenon of a blow-out could be brought under complete control. There was always an element of human error or equipment failure in drilling accidents, but the procedures and equipment for preventing them had generally proved to be adequate. Although it might be impossible for accidents caused by human error or equipment failure to be eliminated completely, there was an urgent need to re-examine safety technology in exploration, to improve procedures and practice and to extend the knowledge of drilling hazards.

The results of the studies of the various drilling accidents that had occurred in United States waters would be made public, and it was to be hoped that they would help others in developing the safeguards required to prevent such accidents, as was called for in General Assembly resolution 2467 B (XXIII).

Mr. SELLI (Italy) said that several delegations had rightly stressed the need for a joint effort by all nations to avoid overlapping in the various research activities needed for marine mineral exploitation.

Italy's research activities were being intensified, particularly in the central part of the Mediterranean. Its National Research Council (CNR) had set up special laboratories for marine geology, geophysics, biology and so on, and research was co-ordinated through the Committee for Oceanography and Limnology. The achievements of the National Research Council's first five-year plan, which would expire in 1969, included a bathymetric map of the central Mediterranean on the scale 1:750,000, and gravimetric and magnetometric surveys of other parts of the Mediterranean. A number of sedimentological, geochemical, structural and paleontological studies had also been carried out.

The second five-year plan (1970-1974), which would entail a considerable financial effort, provided for research into the physics and chemistry of the waters of the Mediterranean and for research on mineral resources and pollution. A refraction and reflection seismic profiling of the whole central Mediterranean

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(Mr. Selli, Italy)

was planned with a view to establishing the general outlines of the tectonics of sedimentary cover and the structure of the crust. The plan also called for the collection of numerous samples and cores, which would be subjected to sedimentological, mineralogical and geochemical study; the preparation of a new bathymetric map of the central Mediterranean on the scale 1:250,000; and detailed gravimetric, magnetometric and geothermal research. Special attention would be given to advanced technologies for the exploration and evaluation of mineral and biological resources.

Various forms of co-operation already existed between Italy and other countries, and all the results of Italian research would be made available to other oceanographers.

The many problems of exploitation had been well described in document A/AC.138/6 and should be thoroughly examined by the two Sub-Committees and by the Main Committee. A high priority should be accorded to the work of determining in geological terms the concept of the continental shelf. A determination in concrete terms would also be helpful for other fundamental structural units, namely: the continental slope, the bathial plains of internal and marginal seas with intermediate crust, the abyssal ocean plains and other important features. The accomplishment of those tasks would represent a valuable contribution to the work of the Legal Sub-Committee.

The Italian delegation also believed that a distinction must be drawn between oceans (with their shelves and slopes) and internal or marginal seas. That distinction should be based not only on obvious geographical criteria but also on geological, oceanographic, biological and practical considerations.

Pollution was a world problem that especially affected countries bordering on marginal and internal seas. Those countries had a particular interest in that problem in view of the special features of those seas, the particular conditions of water circulation, thermal characteristics and so on. His delegation therefore hoped that all Member States would do their utmost to comply with the recommendations on pollution contained in General Assembly resolution 2467 B and D (XXIII).

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Mr. FLEMMING (United Kingdom) said that he wished to comment on certain economic and technical considerations relevant to the encouragement of orderly exploration and evaluation of mineral deposits on the ocean floor, with the understanding that his remarks would in no way prejudice subsequent legal discussions. There were seven major issues which must be settled unambiguously before a potential operator would be willing to invest capital in exploration for marine mineral deposits. Without making any formal recommendations, he wished to clarify certain aspects of each of those issues in turn.

First, there was the question of what type of operating concern - private industry, government bodies or joint concerns - should be authorized to explore and evaluate the resources of the ocean floor beyond the limits of national jurisdiction. As the representative of Australia had pointed out, there was a serious problem in assessing the suitability of applications if leases were to be granted to individual companies. That problem might be simplified if the whole matter was dealt with at a national level.

Second, there was the question of recording, storing and disseminating the data obtained during commercial exploration. Since statements had been made on that subject during the discussion on the establishment of basic documents, that issue need not be further elaborated.

Third, as pointed out in paragraph 24 of the preliminary note by the Secretariat (A/AC.138/6 and Corr.1), operators would require an exclusive lease, within their area, including rights for future exploitation, before undertaking exploration for marine resources. Since leases were commonly restricted to one or more specific minerals, it would be possible to have overlapping lease areas, each exclusive with respect to different minerals.

Fourth, the size of the area to be covered by an exploration lease might be influenced by the mineral in question, the depth of water, the distance from land, the likelihood of successful discovery and the concentration per unit area of the deposit. It was important to stress that provision would have to be made for an equitable distribution of lease areas among States, a point which had not been made in the Secretariat note.

Fifth, complex economic and technical factors determined whether an operator might decide to proceed from exploration to exploitation. At some future time, the Sub-Committee might find it necessary to consider that point.

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(Mr. Flemming, United Kingdom)

Sixth, measures were needed to discourage operators from hoarding their lease areas without exploring them. One way to discourage hoarding was to control the duration of leases. Other methods used by various countries were to require the operator to surrender a proportion of the lease area at specified intervals of time, to have a rental system with annual increments in the rent and to arrange the terms of the lease so that the sum charged per unit area increased with the total area leased. All those measures were designed to encourage early surrender of the less valuable zones.

Seventh, operators expected to be granted exploitation leases automatically if, during exploration, they discovered workable mineral deposits.

Miss MARTIN SANE (France) said that, as she had indicated in her statement at the previous meeting, the exploration and evaluation phases were closely related and, hence, could conveniently be dealt with as a unit.

The first point to be considered was what type of permits might be envisaged for exploring areas of the sea-bed and ocean floor beyond the limits of national jurisdiction. A very simple system might be set up under which a prospector would merely be required to register his intent to explore a given area with the appropriate international body. Another, more restrictive, arrangement would be to require a prospector to apply for a permit that would impose certain definite conditions upon him, relating, perhaps, to the observance of international regulations, the conservation of marine resources or the prevention of pollution. If the latter course was adopted, it would be necessary to establish precisely what rights were conferred upon the holder of an exploration permit. A decision would have to be taken on whether or not his exploration rights were exclusive for all resources in a given area or only for a specified mineral in that area. The period of time for which the permit would be valid would also have to be determined, and there would likewise be the question whether or not the permit holder would be entitled to exploit any minerals found.

The preliminary note by the Secretariat (A/AC.138/6 and Corr.1) contained the observation that it would be informative to examine what was being done in different countries in relation to the promotion of mineral resources under their national jurisdiction. It would be extremely useful to have detailed studies on that

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(Miss Martin Sane, France)

subject, but, in the meantime, her delegation was willing to share its information on the experience of France with regard to exploration permits.

Two general types of permits were issued in France. Permits of the first type merely authorized exploratory prospecting without any guarantee of subsequent exploitation rights. Those permits were granted on a short-term basis to enterprises which planned to make only a limited capital investment in exploration. If exploitable resources were discovered, the enterprise usually received preference in applying for permission to extract them; and, if permission was refused, the enterprise might receive some form of compensation based upon its capital outlay for exploration. The enterprise was required to make public any information of geographical or geological value obtained during exploration, but it retained certain rights with respect to that information.

The second type of exploration permit was issued to firms prepared to make a substantial investment over a period of years. Having demonstrated its technical and financial ability by submitting a detailed report on the proposed exploration, the enterprise was given the exclusive right to exploit the one or more minerals specified in the exploration permit. The permit was, of course, valid only for a specified period of time - which was, however, generally longer than in the case of the first type of permit - and only for a specified area. It might be issued under various conditions, requiring, for example, periodic progress from the enterprise concerned.

In her country, evaluation operations were invariably carried out by holders of the second type of exploration permit, and that was why it was particularly difficult for her delegation to draw a definite line between exploration and evaluation.

Mr. MIRZA (Pakistan) said that as the establishment of basic documents and the exploration, evaluation and exploitation of mineral deposits constituted four phases in a single process, it was difficult to discuss each one in isolation. Fundamental to the consideration of that process was the need for international co-operation in the exploitation of marine resources and the fact that such exploitation should benefit mankind as a whole. Basic documentation as a guide to the development of resources off their coasts was indispensable to the developing

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(Mr. Mirza, Pakistan)

countries. A number of developed countries were known to have prepared such documentation, and his delegation wondered whether they had offered to share it with the developing countries and, if so, what channels were to be used. The documentation already available was clearly not exhaustive. The most efficient way in which the considerable geological and topographic mapping still required could be undertaken was for the developed countries to assist the developing countries on a bilateral basis. The Sub-Committee should also consider the possibility of existing international bodies providing such assistance. The Intergovernmental Oceanographic Commission (IOC) was one such body, and he wondered whether it was equipped to perform that task. His delegation would welcome an exchange of views on the whole question of international assistance to the developing countries in matters concerning mapping and charting.

The Secretariat had prepared much valuable documentation for the 1968 Conference on the Peaceful Uses of Outer Space, which was now being made available to Governments. The international community was probably nearing the stage when a conference on the peaceful uses of the marine environment would produce equal benefits. The International Atomic Energy Agency (IAEA) was now organized to provide computerized data on available nuclear documentation. A similar international arrangement in respect of oceanographic documentation was a future possibility.

His delegation wondered whether the developed countries that were engaged in marine exploration off the coasts of various developing countries had offered to make the information obtained in the course of their operations available to the coastal States concerned. He suggested that the Sub-Committee's final report should contain a recommendation that that should be done and, furthermore, that if the coastal States in question so desired, their nationals should be actively involved in the subsequent phases of the operations.

Consideration should also be given to ways of ensuring that developing countries had the qualified personnel and capital required for them to engage in the exploration, evaluation and eventual exploitation of mineral deposits. Such assistance might be provided through UNDP or by means of separate provisions within that Programme, or even by the establishment of a new programme of technical

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(Mr. Mirza, Pakistan)

assistance for oceanography. His delegation's suggestions, however, represented nothing more than temporary solutions and could be no substitute for some kind of international machinery to oversee all phases of the exploitation of the marine environment. He would not elaborate further on that point because his delegation was awaiting the Secretary-General's report on the possibility of establishing such machinery.

The CHAIRMAN, commenting on the debate, said that several delegations appeared to consider it possible for the procedures followed in the national régimes applicable to the sea-bed within the limits of national jurisdiction to be adopted to the granting of concessions in areas beyond such jurisdiction. In view of the differences between national procedures, however, it was obvious that some kind of "common denominators" would have to be agreed upon. One representative had described two clearly distinct formulae for the granting of exploration concessions, under which the concessionaires themselves assumed increased obligations. Other speakers had emphasized the need for incentives to encourage the prompt exploitation of concessions. The need to reduce the harmful effects of such operations on the marine environments had also been stressed. In all probability, however, it would be impossible for accidents to be entirely avoided. Hopes had been expressed that international co-operation in the development of marine resources for the benefit of mankind as a whole would be further strengthened, with particular emphasis on assistance to the developing countries. It had also been suggested that there should be a clear geological definition of the structural characteristics of the various areas of the sea-bed and ocean floor.

If there was no objection, he would take it that the debate on items 2 (c) and (d) was concluded and that the Sub-Committee agreed to take up item 2 (e) at its next meeting.

It was so decided.

The meeting rose at 12.25 p.m.

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SUMMARY RECORD OF THE NINTH MEETING

Held on Friday, 21 March 1969, at 10.50 a.m.

Chairman:

Mr. DENORME

Belgium

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PRELIMINARY STUDY OF THE WAYS AND MEANS OF PROMOTING THE EXPLOITATION AND USE OF THE RESOURCES OF THIS AREA, AND OF INTERNATIONAL CO-OPERATION TO THAT END, BEARING IN MIND THE FACT THAT SUCH EXPLOITATION SHOULD BENEFIT MANKIND AS A WHOLE (RESOLUTION 2467 A (XXIII), PARAGRAPH 2 (b); PRELIMINARY NOTE BY THE SECRETARIAT, IN ACCORDANCE WITH THE DECISION TAKEN BY THE COMMITTEE ON 7 FEBRUARY 1969) (A/AC.138/6 and Corr.1) (continued):

(e) EXPLOITATION OF MINERAL DEPOSITS

Mr. ABDEL-HAMID (United Arab Republic) said that he agreed with the Australian representative's suggestion (A/AC.138/SC.2/SR.5) that effective, credible and impartial arrangements under the administration of a regulatory authority should be made for the exploitation of the sea-bed; those arrangements should command the confidence of all nations regardless of their political ideology, their state of industrialization or their geographical position.

While not wanting to encroach upon matters that were being dealt with by the Legal Sub-Committee, his delegation wished to express its confidence in the United Nations Charter, which, as a dynamic international instrument for promoting co-operation between Member States, was surely able to provide guidance in the search for a solution. Although many of the recent developments in science and technology could not have been envisaged when it was being drafted, the Charter had never been intended to establish one particular pattern of international co-operation, and it provided several possible approaches to the problem of elaborating a legal régime to govern the exploration and exploitation of the sea-bed.

Although his delegation hoped that some kind of international machinery would be set up in the near future, it agreed with the view that provisional arrangements should be made immediately on a pragmatic basis and in some simple and uncomplicated manner that would not prejudice the legal issues underlying the problems of exploration and exploitation.

A pragmatic approach was necessary in order that the basic documents required to define an area concerning which no definition had as yet been agreed on could be prepared. Equally, plans for future exploitation for the benefit of mankind could not be made until the sea-bed had been explored, and it was obvious that unless incentives were offered to commercial enterprises, the world community would suffer from their reluctance to engage in such exploration or to disseminate the

(Mr. Abdel-Hamid, United Arab Republic)

results of their research. At the same time, safeguards should be established to protect the interests of mankind as a whole, and the registration of activities beyond the limits of national jurisdiction should be given the most serious consideration. The registration particulars should include the limits of the area to be explored and the estimated period of exploration. There should also be an obligation on the exploration undertaking to submit evidence of its competence before beginning work and thereafter to provide progress reports at regular intervals.

By virtue of the resolutions which it had adopted at its twenty-second and twenty-third sessions, the General Assembly had become a de facto board of trustees for the sea-bed, and it was indeed already exercising its trust. As the only world body having the support of 126 nations, it could not transfer its responsibilities elsewhere.

The proposed provisional arrangements would not, of course, be adequate to narrow the gap between the developing and the developed countries, and it was therefore to be hoped that progress would be made in the Main Committee towards establishing the permanent machinery that was necessary. In the meantime, however, other practical issues would have to be dealt with, such as financing; co-operative planning and research as a prelude to collective exploitation; the training of personnel in the developing countries; safety standards for personnel and equipment; and compensation.

Despite the need for simplicity in the temporary arrangements, they should nevertheless be designed to bring about an equitable distribution of sea-bed resources among all nations. While it was too early to discuss levies because of such questions as their amount and the collecting authority, the most acceptable arrangement in the transitional period might be to create a development fund and establish the principle of voluntary contributions.

Mr. CROSBY (Canada) said that the most important factor in promoting resource exploitation in the areas beyond the limits of national jurisdiction would be a system of resource management designed to encourage and maintain investment on a continuing and orderly basis, for the large amounts of investment capital needed would not be forthcoming without some assurance of an enlightened regulatory and administrative climate within which to operate.

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(Mr. Crosby, Canada)

To design a suitable and acceptable system for dealing with the exploitation of off-shore mineral resources beyond the limits of national jurisdiction would not be an easy matter. A great deal of scientific, technical and economic expertise would have to go into its establishment and maintenance. The compilation and appraisal of new scientific information would, for example, determine what sort of mineral deposits could be expected, where they might be encountered and what sort of exploitation problems would have to be solved in any successful operation.

As several speakers had pointed out, the lack of comprehensive knowledge of the deep ocean floor called for an immediate remedy. Canada hoped to play its part with its Hudson 70 Expedition, which would leave Nova Scotia towards the end of 1969 to undertake a year-long research programme in the Atlantic, Pacific, Arctic and Antarctic Oceans. That programme would include geological and geophysical surveys, and ocean circulation, biological, chemical and other types of oceanographic studies. Canada was also developing a system of computer storage and retrieval for geological reports and documents as well as for sub-surface information obtained from drilling. That need and the need to standardize instruments and methods had rightly been pointed out by several delegations and it was to be hoped that the Canadian system would be compatible with those of other nations.

It was clear that a regulatory authority would have to be set up to which operators would submit advance notices of proposed programmes, provide information and appropriate materials on a regular basis and furnish comprehensive technical reports. Canada had laid down detailed requirements for the provision by operators of technical reports and documents to government agencies so that the economic potential of different areas could be regularly evaluated. It was the policy for data and materials resulting from the drilling of an exploratory well to be made available two years after the suspension, completion or abandonment of operations.

With regard to the economic aspects of a resource management system, adequate economic incentives would have to be given to attract the necessary investment capital. That, however, would have to be done without prejudice to the interests of the international community, and care would also have to be taken to ensure that rights were granted on a non-discriminatory basis. The Canadian system for

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(Mr. Crosby, Canada)

granting rights with respect to off-shore oil and gas included three basic elements: (1) exploratory licences; (2) exploratory permits; (3) leases. First, at the outset, before undertaking any exploration work, a party must acquire an exploratory licence. That allowed him to carry out exploration activities anywhere in Canada's off-shore areas, short of drilling a well in excess of 1,000 feet. Secondly, an exploratory permit, in contrast to a licence, involved a specific area. It gave the permittee two exclusive rights only: the right to drill wells deeper than 1,000 feet within the permit area, and the right to acquire leases within that area. Financial guarantees must be deposited by permittees and those were returnable only when specified work requirements had been met. Thirdly, before commencing commercial production, the permittee must obtain a lease, which granted exclusive production rights and under which royalties were payable to the Government.

Mr. St. JOHN (Trinidad and Tobago) said that the technologically advanced countries had made impressive progress in oceanographic research, and it was clear that the resources of the sea-bed would come within the range of economic exploitability in the not-too-distant future. Unfortunately, the vast majority of countries were unable to exploit resources even in their own territorial waters, and it was therefore important that precautionary measures should be taken now to ensure that the benefits of exploitation carried out by the few were shared equitably among the many.

It was obvious that at present most of the technologically less developed countries would not be able to participate actively in sea-bed exploitation and that only those countries currently involved, possibly with a few additions, would in fact explore and exploit the area. Nevertheless, steps should be taken to ensure that the rights and reasonable expectations of those countries willing and able to join in exploration would be guaranteed and that the rest of mankind would obtain its share of the benefits.

Of the various suggestions that had been put forward by the Australian representative on 17 March 1969, the delegation of Trinidad and Tobago considered the establishment of a regulatory authority to be the most important. At the

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(Mr. St. John, Trinidad and Tobago)

present early stage of sea-bed exploitation, the United Nations had an excellent opportunity to prevent the area from being divided up in the same way that the world's land surface had been carved up in the past by colonial Powers. He hoped that the Secretary-General's report on the question of establishing international machinery - which was to be ready for discussion at the Committee's third session - would contain some useful suggestions in that regard.

He agreed with the Nigerian delegation that the co-operation of the developing countries depended to a large extent on their active participation in any venture. It was true, of course, that the developing countries did not have the necessary technological skills. They were, however, rich in human resources, and he hoped that their people would, in future, be trained to participate in expeditions like that of the Glomar Challenger. Marine scientists were already beginning to emerge in the developing countries, but as they specialized mainly in the living resources of the sea, it was important that experts in other areas of marine science and technology should be trained. New training programmes should therefore be established, and the existing ones should be expanded and be given better publicity in an endeavour to achieve a situation where off-shore exploration would be carried out not merely in sixty-six countries but rather by sixty-six countries.

Mr. LIVERMORE (Australia) said that there appeared to be no dispute that there was an area of the sea-bed and ocean floor which lay beyond the limits of national jurisdiction and that its exploration and the use of its resources should be for the benefit of mankind as a whole. Until such time, however, as those resources could be marketed at competitive prices, there was little chance of tangible benefit to the peoples of the world. In considering any arrangements for such exploitation, therefore, it was important not only to envisage some form of encouragement to potential operators but also to devise conditions which would ensure that mankind as a whole received an equitable share of the benefits of production.

His delegation had already suggested that régimes governing the development of mineral deposits on land, or from continental shelves within the limits of national jurisdiction, could be examined to determine whether they had relevance to the sea-bed and ocean floor beyond the limits of national jurisdiction. In national legislation, there were two commonly-used systems for the issue of titles.

(Mr. Livermore, Australia)

One system provided for the issue of an initial exploration title probably over quite a large area with a guarantee of the grant of a production title, usually over a much smaller area in the event of a discovery. The other was to allow general exploration by all interested parties within a given area and then to allocate exclusive production titles over a section of the area on conditions determined by the regulatory authority. It might well be that the exploration and use of sea-bed resources would best be encouraged by adopting a system of exclusive exploration rights with a guarantee that the operator would be given the right to develop and exploit any discovery.

In Australian continental-shelf areas, the Government issued exploration permits for petroleum exploration over areas of as much as 10,000 square miles, with a guarantee of production title over an area of not more than 250 square miles. Any rights granted for operations outside the limits of national jurisdiction should be over areas large enough and for periods long enough to allow of economies of scale in operations, but they should also ensure that both the area and the period were such as to ensure effective and energetic working of the concession by the operator. Detailed consideration should be given to specifying what minerals or groups of minerals would be covered by both exploration and production titles. The simplest form of title would give rights of production in respect of any and all minerals discovered, but, as mining and extracting techniques varied greatly, his delegation considered that all-embracing titles should not generally be contemplated.

Mankind as a whole stood to benefit from the production of sea-bed resources in two ways: by obtaining additions to the world inventory of minerals, which were a wasting asset, and by sharing in the proceeds from the sale of the product with the operator, whether private or governmental. It was extremely important that there should be stability in the ground rules so that operators could plan confidently. At the same time, there should be some provision for the renewal of production titles so that the granting authority would be able to revise the conditions under which the renewed titles were granted - for example, by making them subject to higher rates or royalties.

While his delegation reserved its position on the nature and form of any arrangements for a régime which might eventually be agreed upon, it felt that, in

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(Mr. Livermore, Australia)

any consideration of such arrangements, a careful balance would have to be maintained between ensuring a high degree of technical competence and skill on the part of the regulatory authority set up and avoiding the establishment of an international bureaucracy which was apt to absorb all direct financial benefits accruing from the exploitation of marine resources. Any regulatory authority which might be set up would have to be competent to ensure that production conformed with good mining practice and that the maximum benefit was being obtained from marine resources. It was essential that such operations should not interfere unjustifiably with other activities on the sea-bed or in or on the superjacent high seas. Constant vigilance would be necessary in order to guard against pollution and any operations which could upset the natural ecological balance of the environment. Furthermore, ways would have to be devised for verifying the quantities of minerals recovered and fairly assessing their value so that mankind as a whole might receive its equitable due.

Mr. KROYER (Iceland) said that his delegation greatly appreciated the substantial scientific, technical and economic information which had been provided by previous speakers. The current debate had been extremely useful in that it had shown that the Ad Hoc Committee's conclusions of 1968 had been substantially borne out by subsequent developments. All speakers had again emphasized the paucity of current knowledge about the resources of the ocean floor, a factor which should serve as an incentive to all Governments to co-operate in an international programme for the exploration and charting of marine resources.

His Government regarded effective international co-operation as the only realistic way of ensuring the successful exploration and exploitation of marine resources. It was ready to participate in an extended, long-range programme of international co-operation in oceanographic research and, in particular, in the International Decade of Ocean Exploration, which would be an important part of such a programme.

The charting of the sea-bed and its resources was a task of such magnitude as to require co-operative planning and execution, freedom of research and a free exchange of information. The results of research beyond the limits of national jurisdiction should be made available to all. His Government's research off

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(Mr. Kroyer, Iceland)

Iceland, southern Greenland and in the Arctic and North Atlantic had been mainly concerned with marine biology. At the same time, however, echo-soundings of the contours of the ocean floor had been taken, together with innumerable samples from the surface of the sea-bed. A weak point in such activities, however, was the fact that the data collected on the sea-bed itself had not been processed or put to use. The same applied to the ocean research programmes of several other countries and was due either to a lack of skilled personnel or to the fact that attention had been concentrated on living marine resources, primarily fish. Obviously, therefore, his delegation welcomed the suggestion for the establishment of an international data-processing centre to collate and disseminate oceanographic information for technological and industrial purposes. The Intergovernmental Oceanographic Commission might play the central co-ordinating role in that respect.

Several speakers had indicated the need for a clear definition of the boundary between the area of the sea-bed within national jurisdiction and that beyond it. An exchange of views in the Legal Sub-Committee on that issue would be a useful first step towards such a definition. His Government had recently submitted to the Parliament a bill establishing Iceland's sovereign rights over the continental shelf within the terms of the Geneva Convention. A final definition of the limits of jurisdiction would be enacted only after a generally agreed international definition of the limits of national jurisdiction had been formulated.

At the 1968 session of the Ad Hoc Committee, his delegation had drawn attention to the dangers, particularly of pollution, that were involved in all activities relating to the exploration and exploitation of marine resources. It was gratified that all previous speakers in the current debate had given prominence to those hazards. Appropriate safeguards and anti-pollution measures should be central to any international co-operative effort in the marine environment. The adoption of such measures should be one of the principles to be agreed upon by the Sub-Committee as a guideline for future activities and as a feature of any régime to govern the marine environment beyond the limits of national jurisdiction.

Mr. OULD HACHEME (Mauritania) said his delegation hoped that the very interesting information provided by the countries engaged in the exploration and exploitation of the sea-bed was also being made available to countries without the technical means of obtaining it. Unfortunately, the developing countries did not have the equipment or qualified staff needed to exploit and develop off-shore wealth, and his delegation considered it a duty of the Sub-Committee to emphasize the vital need for continuous international co-operation. It was clear that the training of qualified staff was the first step required to enable the developing countries to play an active part in the exploitation of the sea-bed and to ensure that the gap between the developed and the developing countries did not continue to widen.

Mauritania's economy depended to a considerable degree on marine resources, and it was therefore ready to collaborate in any attempt to make them available to the world economy on a larger scale. On 7 December 1968, Maître Moktar Ould Daddah, the President of Mauritania, had launched his country's first oil-drilling expedition along the Mauritanian coast.

Whatever the Sub-Committee decided to do, there was no doubt that an international régime should be set up that would be acceptable to all nations and would guarantee fair treatment for all.

Miss MARTIN SANE (France) observed that the Sub-Committee's task, as pointed out in the preliminary note by the Secretariat (A/AC.138/6 and Corr.1), was to amass information on national practices with regard to the development of marine resources and then to extract those "common denominators" which might usefully be applied under an international régime. On the basis of national experience, certain suggestions could be made regarding the ways which had proved most effective in controlling the exploitation of marine mineral resources within the limits of national jurisdiction.

If an operator was to undertake the exploitation of a given mineral, he would require an exclusive title to the deposit for a definite period of time. That title would ordinarily state the rights and obligations of the operator and any conditions with which he was to comply during exploitation. Any fees that were collected from him would, at the initial stages of exploitation, have to be nominal,

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(Miss Martin Sane, France)

and they might be based on a sliding scale which would take into account the relative difficulty of the operation, the distance from land and transportation costs. The Sub-Committee would have to consider the whole question of concessions and fees in more detail at a later date.

Certain aspects of exploitation also deserved attention. First of all, provision would have to be made to protect the installations and the equipment used by an operator and to ensure that they did not harm the marine environment or present a hazard to shipping. To protect the installations and equipment used for exploration and exploitation, a security zone could be set up restricting the access of ocean-going vessels to the area. Restrictions might also be placed upon aircraft flying over the security zone. The nature of the security zone would, of course, have to be clearly defined in international law so as not to infringe the traditional freedom of the seas and of the air. There were precedents for such restrictions. The International Civil Aviation Organization, for example, had established a procedure whereby aircraft pilots were warned of possible dangers in certain areas, and article 9 of the Chicago Convention envisaged the possibility of prohibiting aircraft from flying over certain areas.

As to the problem of protecting the environment from the possible ill effects of exploration and exploitation, certain instruments of international law already existed which could be adapted to the requirements of marine resources development. Those included the 1960 Convention for the Safety of Life at Sea and the International Code of Signals established by the Inter-Governmental Maritime Consultative Organization. Provisions might also be made, in whatever future instrument of international law was adopted for inspecting marine installations and ensuring the removal of installations no longer in use.

Freedom of navigation could be protected by setting up special shipping lanes which would be kept free of obstacles as was already done, for example, in the English Channel.

It might also be useful to set up a group of experts to study possible measures for ensuring the safety of marine installations. They could be guided by national practice in that regard.

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(Miss Martin Sane, France)

The United States delegation had given a dramatic illustration of the problems of pollution which could arise when exploiting marine resources, and the seriousness of that problem did not need to be stressed again. At the present time, the Inter-Governmental Maritime Consultative Organization was working with the International Maritime Committee to prepare draft conventions dealing with the problem of hydrocarbon pollutants discharged into the ocean by ships. A conference on that subject would be held at Brussels in November 1969 and would consider, inter alia, the right of coastal States to intervene to prevent pollution, the problems of responsibility for pollution, compensation of damages, and insurance against pollution. —Those draft conventions could perhaps be modified to include pollution resulting from activities concerned with the development of marine resources. In that connexion, her delegation was pleased to note that the Inter-Governmental Maritime Consultative Organization was actively considering proposals to prevent and control pollution of the seas, of the air and of the land by ships and other ocean-going vessels.

Lastly, as the representative of Libya had pointed out at Rio de Janeiro, some system would have to be devised to give special guarantees or advantages to operators who were willing to undertake the exploration and exploitation of the resources of the sea-bed and ocean floor.

Mr. SULEIMAN (Libya) drew attention to the importance of international co-operation in the field of submarine archaeology. There were numerous remains of ancient civilizations and even whole cities that were preserved beneath the ocean. The investigation of those remains through the use of modern techniques would yield historical knowledge and might lead to the discovery of priceless art treasures. The promotion of international co-operation in that field could help States, particularly the developing countries, to salvage long-lost riches from the ocean floor.

Mr. MEYER PICON (Mexico) said that marine mineral deposits were not subject to man-made frontiers and that a single deposit might fall partly within international territory and partly within national territory. Petroleum deposits, in particular, posed a problem, for an oil well on international territory might be tapping a deposit which extended into national territory. One way to handle

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(Mr. Meyer Picón, Mexico)

that problem was to create a buffer zone between the national and international areas and to give priority or exclusive exploitation rights to the State into whose territory the deposit extended. An alternative solution would be for the international authority and the coastal State to undertake exploitation jointly.

His delegation was also concerned about the possible effect of the exploitation of marine minerals on world market prices. The developing countries, whose international trade depended on the export of primary products, would find it intolerable if the exploitation of international mineral resources should depress the world prices of those products. The international authority issuing exploitation permits would therefore have to give careful consideration to the world demand for the products to be exploited. It should, in particular, consult the principal producing and consuming countries through some kind of investigatory or negotiating body.

Since accidents occurring in the course of marine exploitation could harm marine fauna and flora with serious consequences for the economy of coastal States, some insurance scheme must be devised providing, in particular, for compensation for damage to third parties.

With regard to the need for disseminating information on the exploitation of marine mineral resources, his delegation recommended that a clause should be included in each international exploitation permit stipulating that the operator must make public all scientific data obtained in the course of his work as well as his methods of exploitation. The operator should bring the nationals of developing countries into his activities, giving priority to those countries which possessed the same or similar mineral deposits within their territory.

Mr. PROHASKA (Austria), Rapporteur, announced that the first part of the draft progress report of the Economic and Technical Sub-Committee had been circulated as document A/AC.138/SC.2/4; it covered the consideration of item 1 of the programme of work (A/AC.138/SC.2/2). The second part of the draft report, covering the consideration of item 2, would be available on Tuesday, 25 March.

In preparing the draft report, the Rapporteur's notes, which had been issued regularly after each meeting for the consideration of delegations, had been used as a guide. Suggestions regarding the Rapporteur's notes which had been submitted by many delegations, had been co-ordinated and had been incorporated in the text.

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The CHAIRMAN, commenting on the debate, said that a vast amount of valuable information had been presented by the contributing delegations and a number of suggestions had been made.

In order to promote the exploitation of the resources of the sea-bed and ocean floor beyond the limits of national jurisdiction, an international system of administration would have to be organized. Its aim would be to encourage capital investment in that area and to protect the interests of the international community. Such a system would require the services of a wide range of scientific and technical experts. Caution would have to be exercised to ensure the availability of expert services while avoiding the risk of creating an international bureaucracy.

Many delegations had proposed formulae for granting exploration and exploitation permits. It would be necessary to seek a common denominator among those national formulae and to consider further their respective advantages and drawbacks.

Since many developing countries did not presently have the technical ability to participate in the development of marine resources, and there was slight possibility that they would be significantly more able to do so in the immediate future, it was essential to set up training programmes to prepare national cadres with a view to their ultimate participation in marine resources development.

Since the economies of many developing countries were dependent on the export of certain primary commodities, it would be necessary to study the impact of exploiting marine resources on the relevant world prices and markets.

The question had been raised about what should be done with marine mineral deposits situated partly within and partly beyond the limits of national jurisdiction. The creation of a buffer zone had been one of the suggestions made.

It had been pointed out that marine installations would require protection and, at the same time, measures would have to be taken to prevent such installations from becoming a danger to the marine environment or a hindrance to other maritime activities.

Stress had been laid once again on the urgent need to envisage appropriate measures to prevent pollution of the sea-bed and the ocean floor beyond the limits of national jurisdiction.

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(The Chairman)

Since there was at present no provision in international law to prevent the selfish exploitation of marine resources beyond the limits of national jurisdiction by any operator, it was imperative to establish some kind of interim, transitional arrangement for that purpose as soon as possible.

Attention had also been drawn to the need for international co-operation in the field of marine archaeology.

The meeting rose at 1 p.m.

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SUMMARY RECORD OF THE TENTH MEETING

Held on Monday, 24 March 1969, at 8.40 p.m.

Chairman:

Mr. DENORME

Belgium

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PRELIMINARY STUDY OF THE WAYS AND MEANS OF PROMOTING THE EXPLOITATION AND USE OF THE RESOURCES OF THIS AREA, AND OF INTERNATIONAL CO-OPERATION TO THAT END, BEARING IN MIND THE FACT THAT SUCH EXPLOITATION SHOULD BENEFIT MANKIND AS A WHOLE (RESOLUTION 2467 A (XXIII), PARAGRAPH 2 (b); PRELIMINARY NOTE BY THE SECRETARIAT, IN ACCORDANCE WITH THE DECISION TAKEN BY THE COMMITTEE ON 7 FEBRUARY 1969) (A/AC.138/6 and Corr.1) (concluded):

(e) EXPLOITATION OF MINERAL DEPOSITS

Mr. McKELVEY (United States of America) said that he wished to comment on points raised by various delegations concerning the question of international co-operation.

Referring to the question, raised by the representative of the United Arab Republic, of whether priorities could be assigned to geographic areas to be mapped and surveyed, he said that the criteria for assigning priorities to some of those areas had already been established by the information at hand and by the present state of technology. Thus, if the available information indicated that a certain area was likely to contain valuable mineral deposits, that area should be given priority in investigation. It was in general desirable to work from shallow to deeper waters, since the technology for working in deep waters could be expected to improve with time.

Scientific exploration of the sea-bed and continued oceanographic research were fundamental to assessing the mineral wealth of the ocean floor. The Intergovernmental Oceanographic Commission was currently developing a programme for international co-operation in surveying and mapping. Also, the United States Government was considering recommendations for co-operative investigations in which it might participate. Those would probably include: (1) geological and geophysical surveys of the North American continental shelves and the eastern Atlantic continental margin; (2) assessment of the mineral resource potential of small ocean basins, such as the Gulf of Mexico, the Caribbean Sea, the Mediterranean Sea and the East Indies area; (3) surveys of selected Pacific sites of manganese nodules and phosphorite deposits; and (4) studies of oceanic ridges and trenches, such as the mid-Atlantic Ridge and the Peru-Chile Trench.

(Mr. McKelvey, United States)

His delegation heartily concurred in the need for providing assistance to the developing countries with respect both to providing increased knowledge about their coastal areas and to the training of specialists. It would be desirable for the potential off-shore mineral resources of some developing countries to be investigated through bilateral assistance and through pre-investment surveys under UNDP auspices. The United States had in that regard already supported marine research in fifteen developing countries and was providing training in the United States for more than 100 marine scientists and engineers from the developing countries.

There should also be an exchange of information on oceanographic research through scientific publications and international seminars and symposia; a particularly useful proposal along those lines was for IOC to establish a reference service and to expand its information centres. Similarly, IOC could act as a co-ordinating agency for the standardizing of procedures and calibrating of equipment.

In response to a suggestion made by the representatives of Mexico and Italy, his delegation had prepared a short description of the geology and physiography of the sea-bed and ocean floor as they related to the distribution of mineral resources. That document would be duplicated and circulated to all delegations for their information.

Turning to the question of sea-bed resource development, he pointed out that certain geological and economic factors must be taken into account in any system of marine resource development, whether national or international. The terms for exploration permits, for example, would vary from place to place and from time to time. In the United States, petroleum exploration permits were non-exclusive and conferred no subsequent rights to exploitation, since the areas explored were usually adjacent to on-shore producing provinces, and there was great likelihood of discovering similar productive deposits off-shore. In Australia and Canada, on the other hand, the terms were more favourable to the operator, with the result that the amount of off-shore exploration in areas with no existing on-shore production was appreciably greater. Thus, widely varying terms might be appropriate in the varied circumstances that would be encountered in the development of sea-bed resources beyond the limits of national jurisdiction.

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(Mr. McKelvey, United States)

The fact that the geological characteristics of minerals differed influenced both the size of the sub-sea area required for economically viable operations and the time required to achieve production. Exploration and exploitation permits must therefore take into account the fact that a much larger area might be required for purposes of exploration than would ultimately be required during exploitation.

The presence of concealed deposits could be established only by drilling or other means of exploration, and the amount and quality of both exposed and unexposed deposits could be determined only by extensive and expensive forms of sampling, possibly even requiring some production experience. Where such expensive forms of exploration were involved, the operator would need an exclusive right to explore and to produce if workable deposits were found. However, low-cost exploration could be done on a non-exclusive basis. Because the value of workable deposits could not be determined in advance, payment for exclusive exploration rights should be related to actual production rather than to a pre-determined estimate of the value of an unexplored area.

Since mining called for high investment risks, an operator must be encouraged by the possibility of obtaining higher profits than those usual in many other enterprises. Although the high risk in mining could not be eliminated altogether, it tended to diminish with increasing knowledge about the occurrence of recoverable minerals in a given area and with increasing experience in producing them.

Net resource value - the surplus remaining after selling the mineral and paying both production costs and the profits on risk investment - was the amount which the resource owner could hope to receive from the production and sale of the resources mined. Net resource value varied considerably and might even be close to zero at the outset of sea-bed exploitation. It would, however, increase over time if risks were diminished, if production costs could be reduced and if world market prices remained stable.

Direct revenue from the production of minerals was welcome to all Governments, and for developing countries it might represent the principal benefit to be derived from the production of sea-bed resources in the immediate future. The chief value of minerals, however, was in the chain of economic activities that surrounded their production and followed on their use. Those benefits would come to be shared by all the people of the world. In the long run, therefore, the goal should be to

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(Mr. McKelvey, United States)

encourage sub-sea production for the sake of the raw materials it would make available rather than merely for the direct revenue that might come from the sale of sea-bed resources.

It was widely recognized that, in regulating the development of marine resources, Governments had the responsibility of maintaining safe practices and preventing damage to other values and uses of the sea. In addition, however, Governments should also concern themselves with the problem of conservation in production in order to ensure that minerals were extracted with maximum ultimate recovery.

Mr. GRANELLI (Argentina) said that the exploitation of mineral deposits could not be discussed in isolation from such other matters as accurate navigation aids, exploration, concentration of minerals, processing and marketing.

The general considerations which he would now like to discuss could be regrouped under five headings: the accuracy of navigation systems; standardization of oceanographic instrumentation; use of computers in oceanology; a modern scientific description of the continental margin or terrace; and an intermediate buffer zone.

The accuracy of navigation systems was important both for the proper siting of the research vessels engaged in the evaluation of mineral resources and as a basis for the preparation of reliable geological and topographic maps of the ocean floor.

Although great progress had been made over the past thirty years in electronic navigation methods and even in traditional astronomical techniques, electronic navigation aids were not readily available in many parts of the ocean beyond the limits of national jurisdiction and in some developing countries they were non-existent. Steps should therefore be taken to improve that situation in the immediate future.

The standardization of oceanographic instrumentation was an important factor in the international exchange of information. International standards for physical and chemical oceanography had been accepted by many countries and should also be established for the scientific data and samples collected in sea-bed research in order to ensure their comparability at the international level. His country would continue to co-operate in standardization projects.

(Mr. Granelli, Argentina)

The use of computers in oceanology was a vital development if scientists were not to be swamped in a sea of technical data. Since the analysis of data took three times as long as its collection, a processing system suited to the needs of each user was an early priority. That was still another area where the technological gap between developed and developing countries would have to be closed.

A modern scientific description of the continental margin or terrace was a responsibility of the Sub-Committee and should be carried out in detail. At present, that term was used loosely even though it was possible to differentiate between the various submarine topographical features with the use of modern instruments.

His delegation believed that marine geological and geophysical parameters should be incorporated in the working concepts listed in annex I, paragraph 5, of document A/7230. In any definition of the area beyond the limits of national jurisdiction, account would certainly have to be taken of the existence of submarine canyons, ocean ridges, banks, submarine mountains and other features of the sea-bed which still needed to be investigated. Since there was no modern scientific definition of the continental shelf, the Sub-Committee should standardize its descriptions. By so doing, it would not only be making an academic contribution but would also be laying the groundwork for the important August session.

With regard to the Mexico suggestion that an intermediate buffer zone should be established, his delegation believed that the various technical and economic difficulties involved in defining such a zone should be studied. In that regard, the determination of geographic co-ordinates with geodesic accuracy was very important. Although that was one of the more difficult problems of ocean engineering, it was one that should be squarely faced, since the same difficulties that had been encountered in the granting of exploration and exploitation permits in waters under national jurisdiction were also likely to arise in regard to the deep ocean floor.

The establishment of an international régime governing the exploitation of the resources of the sea-bed was of great importance to the developing countries, whose practical participation in such exploitation depended in large measure on the willingness of the countries carrying it out to make the basic information regarding their experience and operations available. In Argentina, the provisions

(Mr. Granelli, Argentina)

of the Hydro-Carbons Act made the granting of exploration permits subject to the requirement that basic information must be supplied to the Government, which undertook not to publish it for two years without the express authorization of the permit-holder.

Mr. GAUCI (Malta), commenting on document A/AC.138/6, said that all delegations had stressed the need for measures to ensure that the resources of the ocean floor should benefit mankind as a whole. He therefore considered the words "may require" in paragraph 5 of that document to be too weak.

In connexion with the statement that one of the main purposes of geological maps was to outline mineralization zones, it should be recalled that claims for exclusive exploitation could be made, and were often granted, at any time during the exploration process, often before economic exploitation had become feasible. Industrialists had urged their Governments to lose no time in claiming exclusive rights to the submarine area up to and even beyond the bottom of the continental slope. The document before the Sub-Committee did not perhaps lay sufficient stress on the fact that only a few countries, because of the need for sophisticated equipment and specialized personnel, were actually in a position to apply for the exclusive exploitation leases which had been recommended. If the phrase "acceptable system" used in paragraph 32 referred to technical and economic requirements, it should not be forgotten that the principle of equity and the interests of mankind as a whole demanded that the developing and the land-locked countries should also be accorded some form of participation in the regulatory measures that were adopted. Whatever international arrangement was agreed upon should protect the entrepreneur, eliminate duplication of effort and be conducive to the preservation of the marine environment.

Many delegations had drawn the Sub-Committee's attention to the technological progress being made. It was worth noting that the 17 March 1969 issue of the Oil and Gas Journal reported that approval was being sought for an eighteen-month extension of the Glomar Challenger Deep Drilling Project. Progress was being made towards developing a re-entry system and if the funds for the project were approved, a system might be in operation by the end of 1969. At 12,000 feet or deeper that activity and its potential were of great interest to the Sub-Committee.

The size of exploitable mineral deposits, which only industry could determine, was a factor of considerable importance, and it seemed certain that the relevant

(Mr. Gauci, Malta)

investigations would continue and would have economic, legal and political implications which might not be easily or immediately reconciled with the interests of mankind as a whole. As there would inevitably be a spirit of competition, a solution to the legal and political problems involved was a matter of urgency. It was also important that industry should be allowed to proceed in an orderly and efficient manner with some kind of protection from outside interference.

While his delegation fully supported the suggestion that scientists from developing countries should be trained on a larger scale, the technological gap was so enormous that the imbalance in favour of the developed countries was bound to continue. Research vessels and equipment, the designs of which were undergoing constant change, absorbed even more investment capital than the training of personnel.

He suggested that a summary by the Secretariat of the main points made during the debates would be useful to delegations and would help the General Assembly in its consideration of the Sub-Committee's report.

A recommendation might be made to the Main Committee that any international régime which might be agreed on must meet the demands of equity, efficiency, competence and international acceptance. Furthermore, with regard to the granting of leases, that should be done without prejudice to the status of the area and on the understanding that a lease did not constitute an indirect claim to national jurisdiction. Until some international régime was agreed upon, it might be necessary to consider interim arrangements for the registration of activities in the area beyond the limits of national jurisdiction, although it must be borne in mind that the practical effectiveness of such arrangements was dependent on progress being made in the delineation of that area.

Mr. ARORA (India) said he agreed with the suggestion made by the representative of France (A/AC.138/SC.2/SR.8) that it would be helpful to know how individual countries were administering off-shore exploration in the areas within their national jurisdiction. As it was probable that the same conditions existed on both sides of the continental shelf, it might be possible to establish common denominators in respect of government measures. The following aspects of that matter might usefully be examined: situation and extent of deposits, types of minerals, duration of exploration and exploitation leases, technical requirements, pollution and safety. He therefore proposed that the Secretariat should review the

(Mr. Arora, India)

measures taken by Governments to promote mineral resource development on the continental shelf, establish what factors were common to those measures and how they might apply to the area beyond the limits of national jurisdiction, and suggest what might be done in those cases where no common denominators existed. A study of that sort would provide useful economic and technical information for the deliberations of the Legal Sub-Committee. It should be based on document A/AC.138/6 and the discussions in the Economic and Technical Sub-Committee, which, as the representative of Malta had suggested, should be made the subject of a separate summary by the Secretariat.

Mr. SHERMAN (Liberia) said that his delegation had already drawn attention to the need for a systematic plan for international co-operation in the exploitation of marine resources for the benefit of all States. He endorsed the statement by the United States and Maltese representatives and whole-heartedly supported the Indian suggestion that the Secretary-General should undertake a study relating to the development of marine resources.

Mr. de SOTO (Peru) said that it was his delegation's clear understanding that the difficult problems of the developing countries were to be kept very much in mind during the Sub-Committee's consideration of item 2 of its programme of work. He was convinced that international co-operation in promoting the exploitation of marine resources required a full exchange of scientific knowledge, the recognition of the individual circumstances of each State and the co-ordinated direction of national and international activities towards common goals. It was in that spirit that his Government had recently granted permission to a United States institution to conduct oceanographic research - as it had previously done in the case of Japanese and USSR expeditions. The organizations concerned had collaborated closely with corresponding Peruvian bodies. International co-operation in such circumstances presupposed that no international action detrimental to the interests of individual States would be taken, for the economic and political integrity of the latter was fundamental to the success of international action.

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(Mr. de Soto, Peru)

The Mexican representative's recent comments on the impact of the exploitation on marine mineral resources on the world market price of primary commodities were of signal importance. The concern felt in that connexion had by no means been dispelled. It had been stated in the Ad Hoc Committee that the developing countries would no longer be dependent on primary commodities by the time that the recovery of significant quantities of marine minerals became possible. That, however, was an excessively optimistic view, and he reiterated his delegation's disagreement with it.

His Government would carefully scrutinize the valuable, informative statements made during the current debate. It was to be hoped that they were a first manifestation of the transfer of oceanographic technology to the developing by the developed countries. He nevertheless considered that the ways and means of promoting the exploitation of marine resources, and particularly international co-operation to that end, must be studied afresh. That should be done in the light of the international régime to be established and, in particular, of the international machinery which was inseparable from that régime and of paramount importance. It was his delegation's sincere hope that future progress in the exploitation of marine resources would form an integral part of the global strategy of the second Development Decade.

Mr. TRONCOSO (Chile) said that the rational exploitation of marine resources for the benefit of mankind as a whole required the widest possible dissemination of oceanographic data among developing countries. Those countries, too, must have access to the necessary means and technology, for exploration should not merely be an incentive for the States having scientific and technological capability to engage in it in order to develop marine resources for their exclusive benefit. Scientific research in an area whose immense potential was still not properly evaluated must be encouraged, but, if there was to be true international co-operation, the results of such research must be open to all. Furthermore, as primary commodities accounted for a considerable proportion of the income of developing countries, those countries had a common interest in preventing large-scale enterprises from using marine resources to depress the world market price of such commodities. As an advance safeguard,

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(Mr. Troncoso, Chile)

certain general principles must be established, with corresponding declarations of good faith, if serious future conflicts were to be avoided. The international community must ensure that an international régime for the exploitation of marine resources for the benefit of all mankind was established and that the related international machinery was set up. The prior establishment of such machinery was a prerequisite for the success of any future régime.

Oceanographic institutions in his country had been engaged in research into the marine environment for the previous 100 years. Also, during the past seven years, the Chilean Navy had been studying the physical and chemical balance of the marine environment at various depths in an area extending 500 miles off-shore from latitude 18° south to the Antarctic. The results of such research had been sent to the oceanographic data centre at Washington for processing and eventual dissemination to the international community.

Mr. NJENGA (Kenya) said that the highly informative discussion in the Sub-Committee had led him to the conclusion that much remained to be done if the primary aim of international co-operation to promote the exploitation of marine resources for the benefit of all mankind was to be achieved. The cardinal issue was how such resources were to be exploited while taking account of the legitimate interests of the developing countries. As the sea was the common heritage of mankind, the developing countries, notwithstanding any technical deficiencies, had a legitimate right to benefit from its resources. Priority must accordingly be given to the establishment of some kind of international machinery under United Nations auspices that would exercise general control over the development of the marine environment beyond the limits of national jurisdiction.

His delegation attached great importance to the Secretary-General's forthcoming report on the establishment of such machinery, which must be more than a mere centre for the registration of claims or the collection of fees. It must embrace all aspects of the development of marine resources from exploration to exploitation and must be the agency through which an equitable distribution of profits from such activities was effected. He nevertheless agreed that the establishment of an unwieldy international bureaucracy, which would absorb the major part of such profits, must be avoided.

(Mr. Njenga, Kenya)

Although, in the exploration of outer space there had been international co-operation in such matters as the establishment of tracking stations, it would be an exaggeration to claim that such exploration had been carried out under international auspices. That type of co-operation was not what his delegation envisaged for the marine environment; it was thinking rather of the kind of activity planned for the International Decade of Ocean Exploration. Every effort must be made to ensure that the developing countries participated in all stages of the development of the marine environment, with the active participation of scientists from those countries, coastal and land-locked alike. The mere dispensation of largesse to the developing countries, as in the case of resources on land, was not sufficient.

The CHAIRMAN said that, if there was no objection, he would take it that the debate on the item was concluded.

It was so decided.

Mr. DE BREUVERY (Representative of the Secretary-General) referred to the two proposals put forward by the representatives of Malta and India respectively, that the Secretariat should undertake a study of the essential factors which might be involved in creating an international regulatory mechanism and a study of the "common denominators" to be extracted from national experience in the development of marine mineral resources. He felt that as those studies would require considerable time and effort to prepare, they could not be ready in time for the third session of the Sub-Committee in August 1969.

The CHAIRMAN suggested that the delegations of Malta and India should consult with the delegations that supported their proposals and with the Secretariat with a view to ascertaining the problems involved in such studies. He also suggested that the representatives of those two countries should reduce their proposals to writing and should define the content and scope of the proposed studies for the Sub-Committee's consideration at a later meeting.

ADOPTION OF THE INTERIM REPORT (A/AC.138/SC.2/4)

Mr. PROHASKA (Austria), Rapporteur, introduced several drafting amendments to paragraphs 4, 7, 9, 12, 14 and 17 of part I of the draft progress report of the Economic and Technical Sub-Committee (A/AC.138/SC.2/4).

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After an exchange of views between Mr. FLEMING (United Kingdom), Mr. McKELVEY (United States of America) and Mr. CROSBY (Canada) regarding the advisability of using either the word "petroleum" or the word "hydro-carbon" throughout the report, the CHAIRMAN suggested that the delegations confer informally among themselves and with the appropriate technical experts in an effort to decide on an agreed formulation.

He said that since substantive considerations were raised in the amendments proposed to paragraph 17, it would be advisable to defer the discussion of those amendments to the next meeting.

If there was no objection, he would take it that the Sub-Committee approved the drafting amendments to paragraphs 4, 7, 9, 12 and 14.

It was so decided.

Paragraphs 18 and 20

Mr. PROHASKA (Austria), Rapporteur, introduced minor drafting amendments to paragraphs 18 and 20 of the draft report.

Mr. McKELVEY (United States of America) proposed a minor drafting change to paragraph 18.

The CHAIRMAN said that, if there was no objection, he would take it that the Sub-Committee accepted the amendments.

It was so decided.

Paragraph 21

Mr. PROHASKA (Austria), Rapporteur, proposed that the initial sentence of the paragraph should be replaced by: "At the end of the discussion of this item, the following observations were made:".

The CHAIRMAN pointed out that if the Sub-Committee accepted that wording, the same formula would have to be used in the corresponding part of each chapter of the report.

Mr. FLEMING (United Kingdom) said that his delegation had some reservations about the content and implications of paragraph 21. He could, however, accept the Rapporteur's proposal on the clear understanding that it did not preclude the eventual adoption of formal conclusions and did not prejudice their content.

The CHAIRMAN said that, if there was no objection, he would take it that the Sub-Committee accepted the wording proposed by the Rapporteur.

It was so decided.

Paragraphs 21, 24 and 25

Mr. PROHASKA (Austria), Rapporteur, introduced minor drafting amendments to paragraphs 21, 24 and 25.

The CHAIRMAN suggested that consideration of the amendments to paragraphs 24 and 25 (e) should be deferred to the following meeting. If there was no objection, he would take it that the Sub-Committee accepted the Rapporteur's proposed amendments to the remaining paragraphs.

It was so decided.

The meeting rose at 11.35 p.m.

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SUMMARY RECORD OF THE ELEVENTH MEETING

Held on Tuesday, 25 March 1969, at 3.30 p.m.

Chairman:

Mr. DENORME

Belgium

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ADOPTION OF THE INTERIM REPORT (A/AC.138/SC.2/4 and Add.1) (continued)

Mr. PROHASKA (Austria), Rapporteur, proposed the addition of a foot-note to the report to make it clear that the term "marine minerals" as used throughout the report included all minerals on or under the sea-bed but excluded minerals in solution in sea water, while the terms "hydro-carbon" and "petroleum" would be used interchangeably to include natural oil and gas.

Mr. FLEMMING (United Kingdom) said that the term "hydro-carbon" should be more precisely defined as meaning crude oil, natural gas and gas condensate.

The CHAIRMAN said that, if there was no objection, he would take it that the Sub-Committee accepted the definitions proposed by the Rapporteur, as amended by the United Kingdom representative.

It was so decided.

Paragraph 17

Mr. LIVERMORE (Australia) read out the text of a paragraph which, after consultations with the representatives of Mexico and Norway, he was proposing as a replacement for the existing text of paragraph 17.

Mr. PARDO (Malta) proposed the addition to the Australian text of the following: "Significant in this connexion is that work towards the development of a system with re-entry capability in deep water is at the problem definition stage. Such a system could conceivably be in operation by the end of this year."

The CHAIRMAN said that, if there was no objection, he would take it that the Sub-Committee approved the Australian text of paragraph 17, as amended by the Maltese representative.

It was so decided.

Paragraph 23

Mr. PROHASKA (Austria), Rapporteur, proposed a minor drafting amendment to the first sentence of paragraph 23.

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The CHAIRMAN said that, although the existing text of paragraph 23 had been approved at the previous meeting, he would, if there was no objection, take it that, exceptionally, the Sub-Committee approved that amendment.

It was so decided.

Paragraph 25

Mr. FLEMMING (United Kingdom) proposed new texts for sub-paragraphs 25 (d) and (e) as follows: "(d) low-cost mining and dredging systems at greater depth have not yet been developed; (e) the development of some surficial deposits may be delayed by the need to develop beneficiation."

The United Kingdom amendment was adopted.

Paragraph 27

Mr. GRABOVSKY (Union of Soviet Socialist Republics) proposed the deletion of paragraph 27 on the grounds that it contradicted paragraphs 21 and 25 and reflected a subjective rather than a scientific approach.

Mr. PARDO (Malta) said that the views expressed in paragraph 27 had been confirmed in a number of studies carried out by industrial concerns. The USSR objection to the text might be overcome if the words "to look at" were replaced by the words "to investigate the possibility of".

Mr. FLEMMING (United Kingdom) said that he agreed with the USSR representative that paragraph 27 was a non-scientific expression of opinion. A variety of industrial and commercial studies had indicated the highly speculative nature of marine ventures, and reports from enterprises concerned in them were far from optimistic.

The CHAIRMAN suggested the postponement of further consideration of paragraph 27 to allow time for informal consultations.

It was so agreed.

Paragraph 28

Mr. PROHASKA (Austria), Rapporteur, proposed a minor drafting amendment to paragraph 28 (b). He said that he had received two proposals in connexion with paragraph 28 (c), one that it should be deleted entirely, and the other that the words "not too distant" should be deleted.

Mr. McKELVEY (United States of America) said that sub-paragraph 28 (c) referred to progress made since the Ad Hoc Committee's last session. The central point was not that industry had become newly aware of the vast mineral reserves contained in the ocean floor but that it was displaying continuing interest in them, particularly with regard to the recovery of manganese nodules. That point was conveyed in paragraph 26, a slight amendment of which would allow the deletion of sub-paragraph 28 (c).

Mr. PAVICEVIC (Yugoslavia) said that sub-paragraph 28 (c) accurately reflected the Sub-Committee's debate and contained an important point which his delegation would wish to see in the final report.

The CHAIRMAN suggested the postponement of further consideration of sub-paragraph 28 (c) to allow time for informal consultations.

It was so agreed.

Part II

Mr. de SOTO (Peru) said that as the Spanish version of part II of the draft progress report (A/AC.138/SC.2/4/Add.1) had been made available only a few hours earlier, his delegation had not had sufficient time to formulate detailed comments on it. In general, however, part II appeared to be lacking in balance. He wondered what the general intention of its authors had been - whether they had sought to reflect the views expressed by individual delegations or to present a consensus reflecting the views of the Sub-Committee as a whole.

The CHAIRMAN said that the authors, in preparing the draft progress report, had been guided by the desire to reflect the opinion of the Sub-Committee as a whole to the fullest extent possible. It was customary for economic and technical working groups to follow that procedure, expressing the general views of the body as a whole. Of course, care had been taken to reflect the views of individual delegations, and those who did not agree with certain parts of the report were free to make reservations or propose amendments.

Mr. de SOTO (Peru) thanked the Chairman for his clarifications. He said that he had no objection to the idea of a report reflecting the general views of

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(Mr. de Soto, Peru)

the Sub-Committee. That had been done successfully, for example, in the report of the Economic and Technical Working Group included in the report of the Ad Hoc Committee (A/7230). However, the draft report presently under consideration, and particularly part II, did not, in his opinion, faithfully reflect a consensus of opinion.

Mr. McKELVEY (United States of America) said he agreed that a general approach had to be taken in the report. It should, however, be made clear that the views expressed did not necessarily represent a consensus of opinion among all members of the Sub-Committee. Since it would be impractical and cumbersome to indicate numerically how many members agreed or disagreed with each paragraph of the report, he suggested that a general statement might be added at the end of paragraph 29, and elsewhere as appropriate, to the effect that "the following observations and suggestions were contributed by members of the Sub-Committee". In addition, it would be useful for qualifying phrases such as "it was suggested that..." to be interspersed liberally throughout part II. Paragraphs which some delegations felt were too strongly stated could likewise be made more acceptable by adding various qualifiers.

Mr. GRABOVSKY (Union of Soviet Socialist Republics) suggested that the discussion of part II of the draft progress report should be deferred to the following day, since there had been so little time for delegations to study the text.

Mr. PAVICEVIC (Yugoslavia) said that he supported the suggestion made by the representative of the Soviet Union. He also shared the view of the United States representative with regard to the need for more qualifying phrases in the report. In addition, he suggested that part II of the report should be discussed paragraph by paragraph in view of the controversial nature of many of the matters raised there.

Mr. PARDO (Malta) said that while he appreciated the need for more qualifying phrases in part II of the report, the Sub-Committee must beware of presenting the report as merely a compilation of the views of individual members, thereby weakening its over-all thrust. There were, after all, areas of substantial agreement among members, and that was the point which should be stressed. In that connexion, he felt that the amendment proposed to paragraph 29 by the United States

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(Mr. Pardo, Malta)

representative could be put more positively in an alternative formulation such as "the following represents the general trend of discussions in the Sub-Committee without necessarily reflecting unanimity of opinion on any one point".

Mr. YANKOV (Bulgaria) said that he supported the Soviet representative's suggestion to postpone consideration of part II to the next meeting. Many important points were made in part II, and his delegation, like others, would like to have more time to study the text. In his opinion, the amendment to paragraph 29 proposed by the representative of Malta was inadequate because it made no provision for qualifying the nature or the extent of the agreement among members with regard to specific points.

The CHAIRMAN said that there seemed to be general agreement among delegations that the discussion of part II of the draft progress report should be deferred to the next meeting in order to give members more time to study it. He suggested that delegations should use that time to prepare concrete proposals for amendments relating to specific paragraphs. The Sub-Committee could then systematically and expeditiously consider the report paragraph by paragraph, as the Yugoslav representative had suggested.

Mr. McKELVEY (United States of America) felt that the matter of the general tone of the report should be settled at the present meeting, since it would affect the way in which the various delegations reacted to the report and the kinds of amendments they would propose. His delegation, for instance, would have to recommend the deletion of certain paragraphs if the report was to be considered an expression of general agreement among the members of the Sub-Committee. As he saw it, the true value of the current session's report was that it presented a wide variety of information and views which would stimulate further thought and discussion. He therefore wished to uphold his amendment to paragraph 29 and requested the representative of Malta to withdraw his alternative amendment.

Mr. PAVICEVIC (Yugoslavia) said that it might be useful to work out a formula for use in part II which would distinguish general views from the points made by individual delegations.

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Mr. PARDO (Malta) said that part II of the report would be a meagre product of two weeks' work if it was to consist merely of a series of related ideas and contained no consensus.

Miss MARTIN SANE (France) said she appreciated the concern expressed by the representative of Malta and others but felt that it was premature at the present stage to define principles. It was right, of course, that the report should contain the many interesting ideas that had been expressed, but, as the United States representative had said, it should avoid being unduly dogmatic.

The CHAIRMAN felt that there need be no serious conflict between the two positions, since both groups were able to enter specific reservations where necessary. If agreement was sometimes reached with difficulty at national government level, it would clearly be necessary for an international committee of forty-two members to seek compromise solutions at the initial stage.

Mr. McKELVEY (United States of America) said he favoured the Yugoslav suggestion that areas where the Sub-Committee had reached a consensus should be mentioned. As, however, the main activity of the Sub-Committee had been to report on national experience rather than to debate the merits of any issue, that fact should be indicated in the report.

Miss MARTIN SANE (France) endorsed the views of the United States representative and thought that a formula along the lines of his amendment to paragraph 29 should be incorporated in the draft progress report so as to avoid the impression that decisions had been taken in a formal way.

Mr. MEYER PICON (Mexico) reminded the Sub-Committee that most interventions had consisted of opinions and suggestions that would be taken up at the next session. Indeed, international machinery, an international régime and the International Decade of Ocean Exploration were items already included in the programme of work and would, of course, have to be considered carefully enough to enable conclusions to be drawn. The value of the Sub-Committee's debate lay in the wealth of good ideas that had been presented, and agreements would surely emerge at a later date.

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Mr. FLEMMING (United Kingdom) said he appreciated the reasoning behind the reservations of the Maltese representative but thought that an attempt to distinguish between what had and had not been agreed would inevitably lead to prolonged discussion. He concurred with the Mexican representative's view that the most satisfactory outcome of the Sub-Committee's discussions was the number of good ideas that had been generated.

He then read out the text of an introductory paragraph intended to describe the status of the contents of the report and to reconcile any conflict of opinion that might exist.

Mr. PARDO (Malta) said that the insertion of the paragraph suggested by the United Kingdom representative would dissipate his misgivings.

The CHAIRMAN suggested that the Sub-Committee, which appeared to be in favour of the United Kingdom text, might like to consider it and make a final decision next day.

It was so agreed.

Other matters

At the request of the CHAIRMAN, Mr. ARORA (India) informed the Sub-Committee that he had had consultations with a number of delegations in connexion with his proposal that the Secretariat should be requested to prepare a study on the action being taken by Governments with respect to activities on the continental shelf within their jurisdiction. The Sub-Committee now had before it an unofficial working paper containing the text of that proposal, and any comments or amendments would be welcome.

Mr. de BREUVERY (Representative of the Secretary-General) said that it would make the Secretariat's task easier if the expression "continental shelf resources" in the working paper was qualified by the word "mineral".

Miss MARTIN SANE (France) said that, for the sake of technical accuracy, the qualifying words should be "mineral and fossil".

Mr. GRABOVSKY (Union of Soviet Socialist Republics) asked what the financial implications of the study would be.

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Mr. de BREUVERY (Representative of the Secretary-General) replied that, subject to the final decision of the Sub-Committee, he thought that existing documents and the goodwill of Governments would enable the study to be prepared without any supplementary costs.

The Indian proposal, as amended by the representative of the Secretary-General and the representative of France, was adopted.

The meeting rose at 5.20 p.m.

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~~SUMMARY RECORD OF THE TWELFTH MEETING~~

Held on Wednesday, 26 March 1969, at 3.20 p.m.

Chairman:

Mr. DENORME

Belgium

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ADOPTION OF THE INTERIM REPORT (A/AC.138/SC.2/4 and Add.1) (continued)Part IParagraphs 27 and 28 (c)

Mr. PROHASKA (Austria), Rapporteur, said that the proposal had been made to delete paragraphs 27 and 28 (c).

Mr. DIGGS (Liberia) said that there was no denying the technological gap that existed between the developed and developing countries. Although there were still many unknown factors, the facts and figures that had been provided should be included in the report. He stressed that the Sub-Committee must not be pessimistic about the future of sea-bed exploration or exploitation, since it had a duty to look to the future in a positive manner. He therefore felt that the original wording of the paragraphs should be retained.

Mr. FLEMING (United Kingdom) said that whether the paragraphs were deleted or were retained, a wrong impression would still be given. He quoted from an article in The New York Times of 18 October 1968, which gave a gloomy account of commercial marine exploitation. He then read out an alternative text for the paragraphs under consideration which he thought might serve as a compromise.

Mr. PARDO (Malta), while conceding that the existing wording of paragraph 27 was too expansive, considered that the United Kingdom text went too far in the opposite direction. He buttressed his argument by quoting from the 31 March 1968 issue of U.S. News and World Report, which referred to manganese nodules being extracted at the rate of 1 million tons per annum in the 1970s.

Another factor, although admittedly outside the Sub-Committee's terms of reference, was that uneconomic exploitation might be justified for political reasons.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) said that the Sub-Committee's report should be based on an objective assessment of facts rather than on news reports inspired by commercial press releases. He regarded the United Kingdom text as a better reflection of the actual situation.

The CHAIRMAN suggested that the representatives of the United Kingdom and Malta should collaborate with a view to producing a joint text and that the Sub-Committee should defer its consideration of the paragraphs under discussion until such a text was available.

It was so decided.

Part II

Mr. PROHASKA (Austria), Rapporteur, introduced a new paragraph to be inserted before paragraph 29. Its text was based on that suggested by the United Kingdom representative at the 11th meeting, but contained certain minor changes as a result of consultations with various delegations.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) pointed out that the Sub-Committee's discussions had not been all-embracing and that the report was merely an outline of possible ways and means of utilizing the resources of the sea-bed. The very fact of the adoption of the Indian proposal to request the Secretariat to prepare a study based on new material was an indication that no common denominators had been found and that the subject had not been exhausted. The Sub-Committee was therefore free to decide which parts of the draft report, if any, it wished to adopt. It might, indeed, prefer not to reach any conclusions before the August session.

The CHAIRMAN agreed that the representative of the Soviet Union had correctly summed up the Sub-Committee's position, but pointed out that the Sub-Committee had agreed to adopt parts I and II of the draft report for reasons of efficiency and logic. Of course, both before and after the August session, and even after the General Assembly, the Sub-Committee should continue to devote its attention to the subject. If members disagreed with any point, they could enter reservations as had been suggested by the representatives of the United Kingdom and Peru.

Mr. KHANACHET (Kuwait), supported by Mr. ABDEL-HAMID (United Arab Republic) and Mr. DIGGS (Liberia), said that the statement "no attempt to resolve the differences was made" gave an unnecessarily negative impression. He suggested more positive wording.

Mr. YANKOV (Bulgaria) said that he agreed with the representative of Kuwait and felt that the words in question could be deleted without impairing the remainder of the paragraph.

The new paragraph, as amended, to be inserted before paragraph 29, was adopted with various drafting changes.

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Paragraphs 29-32

Paragraphs 29-32 were adopted with minor drafting amendments.

Paragraph 33

Mr. PARDO (Malta) proposed that the following words should be added at the end of the final sentence: "compatible with the minimum practical impairment of the marine ecology".

Mr. de SOTO (Peru) said that while he found the Maltese amendment acceptable, he preferred the term "flora and fauna" to "ecology".

The CHAIRMAN said that, if there was no objection, he would take it that the Sub-Committee accepted the Maltese amendment as further amended by the Peruvian representative.

It was so decided.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) said that the reference in the first sentence to "new forms of international co-operation" was obscure; he proposed the deletion of that part of the sentence following the word "devised".

Mr. STANGHOLM (Norway), supported by Mr. McKELVEY (United States of America) said that he agreed with that proposal.

Mr. PROHASKA (Austria), Rapporteur, said that the sentence in question was based on a statement by the Yugoslav delegation. The idea he had intended to convey was that international co-operation in the development of marine resources should be more broadly based than present forms of international co-operation on land.

Mr. PAVICEVIC (Yugoslavia) proposed the following text: "It was stressed that for the development of the resources of the ocean floor, new forms of international co-operation should not reflect present inequalities and differences between developed and developing countries. They should provide for not only equality of opportunity but also equality in the actual enjoyment and equitable sharing of benefits derived from the exploitation of the resources of the ocean floor. A primary goal should be to ensure maximum benefit for mankind as a whole, with particular regard to the needs and interests of the developing countries."

The CHAIRMAN suggested that the Sub-Committee, in the interests of saving time, should take up consideration of the Yugoslav proposal at the next meeting.

It was so decided.

Paragraph 34

Paragraph 34 was adopted with minor drafting amendments.

Paragraph 35

Mr. PROHASKA (Austria), Rapporteur, introduced several drafting amendments.

Mr. PARDO (Malta) suggested a further amendment, viz., the insertion of the words "without conflict," in the first sentence between the words "in an orderly manner" and the words "and in a way not interfering unjustifiably with the other traditional uses of the sea".

Paragraph 35, as amended, was adopted.

Paragraph 36

Mr. PROHASKA (Austria), Rapporteur, introduced an amendment submitted by the delegation of Chile. It would replace the last part of paragraph 36, beginning with the words "there is no prospect... ", by the following: "there would be no tangible incentives for those carrying out such exploitation. Nevertheless, the needs of the developing countries should be taken into account."

The CHAIRMAN pointed out that the idea contained in the last sentence of the proposed Chilean amendment was amply covered in other parts of the report. Since it was possibly out of context in paragraph 36, which was primarily concerned with the exploitation of marine mineral resources on a basis competitive with minerals from land, perhaps the Chilean representative would be willing to withdraw the last sentence.

Mr. SALGADO (Chile) said that the point he was attempting to make in that last sentence was explicitly stated in paragraph 91. It was important to ensure that the exploitation of marine minerals would not result in a drop in prices on the world market for minerals which constituted major exports and sources of income for the developing countries. In the interest of expediting the Sub-Committee's work, however, he withdrew the last sentence of his amendment.

Mr. GRANELLI (Argentina) proposed that the expression "resources of the ocean floor" should be amended to read: "resources of the ocean floor and the sub-soil thereof".

Paragraph 36, as amended, was adopted.

Paragraph 37

Paragraph 37 was adopted.

New Paragraph (to be inserted after paragraph 37)

Mr. PROHASKA (Austria), Rapporteur, read out the text of the following new paragraph to be inserted between paragraphs 37 and 38: "It was noted that the Secretary-General would, pursuant to resolution 2467 C (XXIII), submit a study on the question of establishing in due time appropriate international machinery for the promotion of the exploration and exploitation of the resources of the sea-bed and ocean floor beyond the limits of national jurisdiction. Pending the opportunity to study this paper, the Sub-Committee reserved its position on the nature and form of any arrangements for a régime which might eventually be agreed upon."

The paragraph was adopted.

Paragraph 38

Mr. PROHASKA (Austria), Rapporteur, introduced minor drafting changes and two amendments proposed by the Soviet delegation. According to the first of those amendments, the first sentence would begin with the words: "An opinion was expressed that"; the other amendment was a proposal to delete the second sentence.

Mr. McKELVEY (United States of America) suggested that the wording "It was pointed out that" would be preferable to "An opinion was expressed that". The second sentence could then be retained by joining it to the first sentence with a semicolon. That should be sufficient to indicate that there had been no unanimous agreement on those two sentences.

Mr. PARDO (Malta) said that he supported the amendment proposed by the United States representative. He also suggested deleting the words "who create them" in the third sentence.

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Mr. STASHEVSKY (Union of Soviet Socialist Republics) withdrew his amendments in favour of the alternative United States formulation.

Paragraph 38, as amended, was adopted.

Paragraph 39

Mr. PROHASKA (Austria), Rapporteur, introduced several minor drafting amendments.

Mr. PARDO (Malta) pointed out that the reference to "operating rig" in the second sentence immediately brought to mind the exploitation of petroleum. That was unnecessarily restrictive since the paragraph undoubtedly referred to mineral resources in general. He therefore suggested that an appropriate change should be made in the text.

Mr. McKELVEY (United States of America) suggested that it might be appropriate for paragraphs 38 and 39 to be combined and for the former paragraph 39 to begin with the qualifying phrase: "It was pointed out that". The problem raised by the representative of Malta could be solved by inserting the words "For example," at the beginning of the second sentence of paragraph 39.

Paragraph 39, as amended, was adopted.

Paragraph 40

Paragraph 40 was adopted with minor drafting amendments.

Paragraph 41

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Mr. PANYARACHUN (Thailand) considered that it should be made clear that only arbitrary changes in an operator's conditions of exploitation were being referred to.

Paragraph 41, as amended, was adopted with minor drafting changes.

Paragraph 42

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

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Mr. LIVERMORE (Australia) said that he favoured deletion of the entire paragraph.

Mr. McKELVEY (United States of America) considered that the content of the second sub-paragraph was important and should be included elsewhere in the report if the paragraph as a whole was deleted.

The CHAIRMAN suggested that further discussion of the paragraph should be deferred until a new text was available.

It was so agreed.

Paragraph 43

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Mr. CROSBY (Canada) said that his delegation was far from sure that rights granted in the future under an international régime should automatically be exclusive. It felt that semi-exclusive and even non-exclusive rights should be considered in the interests of stimulating ocean exploration.

After a discussion in which a number of representatives took part, Mr. PROHASKA (Austria), Rapporteur, read out a revised version of the paragraph.

Paragraph 43, in the revised version read out by the Rapporteur, was adopted.

Paragraph 44

Mr. PANYARACHUN (Thailand) said that the "specific measures" referred to in the final sentence could be either preventive or corrective. He therefore proposed that the words "appropriate safeguards to prevent such hazards as well as" should be inserted before the words "specific measures".

It was so decided.

Mr. PARDO (Malta) proposed that the final part of the first sentence, after the words "may create", should be replaced by the words: "a number of serious hazards, both to other uses of the sea and to marine ecology". As the second sentence contained only relatively minor examples of such hazards, he proposed that it should be deleted.

It was so decided.

Paragraph 44, as amended, was adopted with minor drafting changes.

Paragraph 45

Mr. PARDO (Malta) proposed that the words "in undertaking exploitation" should be inserted at the end of the penultimate sentence.

It was so decided.

Mr. STANGHOLM (Norway) proposed the deletion of the final sentence on the ground that the potential ill effects of mineral exploitation in deep water far from land were certainly as significant as those near shore. It would, for example, be more difficult to cope with a blow-out or to obtain expert assistance in deep water.

It was so decided.

Paragraph 45, as amended, was adopted with minor drafting changes.

Paragraph 46

Paragraph 46 was adopted with minor drafting amendments.

Paragraph 47

Mr. ARORA (India) proposed that, in the third sentence, the words "appropriate international arrangements" should be amended to read "an appropriate international régime" in order to bring the text into line with the remainder of the report.

It was so decided.

Mr. SALGADO (Chile) said that the text of the paragraph departed from the Sub-Committee's terms of reference in that it referred to interim steps to further the exploitation of marine resources before the establishment of an international régime.

Mr. de SOTO (Peru) said that he agreed with the Chilean representative. He proposed that a sentence should be inserted at the end of the paragraph stating that some delegations had said it was outside the Sub-Committee's terms of reference to consider interim steps for the development of marine resources before agreement had been reached on an international régime to govern such activities.

It was so decided.

Paragraph 47, as amended, was adopted with minor drafting changes.

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Paragraph 48

Paragraph 48 was adopted.

Paragraph 49

Mr. SALGADO (Chile) proposed that sub-paragraph (e) should be amended to read as follows: "The international régime should be effective, equitable and trustworthy. It should provide economic incentives for the exploitation of marine mineral resources, particularly at the exploratory stage."

Paragraph 49, as amended, was adopted with minor drafting changes.

The CHAIRMAN suggested that the Sub-Committee should postpone its discussion of the section headings until it had finished its consideration of the report as a whole.

Paragraphs 50 and 51

Paragraphs 50 and 51 were adopted.

Paragraph 52

Mr. McKELVEY (United States of America) proposed that the last sentence should be amended to read as follows: "Although widely spaced geophysical and sampling traverses and special purpose mapping provide some information on the geology of the ocean floor, systematic geological mapping of the oceanic basins has not yet begun."

Mr. PARDO (Malta) proposed that some reference should be made to the fact that geophysical mapping of the ocean floor had already begun.

Paragraph 52, as amended by the United States and Maltese delegations, was adopted.

Paragraph 53

Paragraph 53 was adopted with minor drafting amendments.

Paragraphs 54 and 55

Paragraphs 54 and 55 were adopted.

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Paragraph 56

Paragraph 56 was adopted with minor drafting amendments.

Paragraph 57

Paragraph 57 was adopted.

Paragraph 58

Mr. FLEMMING (United Kingdom), pointing out that the paragraph was based on ideas which his delegation had put forward during the discussion, said he felt that the wording should reflect as closely as possible the idea contained in article 5 of the 1958 Convention on the Continental Shelf.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) felt that the paragraph needed to be redrafted and proposed that the Sub-Committee should postpone consideration of it in order to allow delegations to consult one another.

It was so decided.

The meeting rose at 7.35 p.m.

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SUMMARY RECORD OF THE THIRTEENTH MEETING

Held on Thursday, 27 March 1969, at 10.55 a.m.

Chairman:

Mr. DENORME

Belgium

/...

ADOPTION OF THE INTERIM REPORT (A/AC.138/SC.2/4 and Add.1) (continued)

The CHAIRMAN invited the Sub-Committee to take up several paragraphs of Part I of the Report on which action was outstanding.

Paragraph 27

Mr. PROHASKA (Austria), Rapporteur, read out the following compromise text agreed between the United Kingdom and the USSR representatives:

"Industry continues to investigate the potential of the ocean floor as a source of a variety of minerals on account of the large quantities which may be found to be economically exploitable although the cost of exploitation, except in the long-run, may be generally higher than on land."

The paragraph was adopted without amendment.

Paragraph 28

Mr. PROHASKA (Austria), Rapporteur, read out the revised text of sub-paragraph (c):

"(c) Industry is becoming increasingly aware of the vast mineral deposits contained in the ocean floor which could in the future become technically recoverable and economically exploitable."

The text was adopted without amendment.

The CHAIRMAN, replying to a question by the USSR representative, pointed out that, as had been agreed earlier, the introductory sentence in paragraph 28 would confirm to those in the corresponding paragraphs.

Paragraph 33

Mr. PROHASKA (Austria), Rapporteur, read out the amended text submitted by Yugoslavia at the Sub-Committee's twelfth meeting.

Mr. PARDO (Malta) proposed the addition, at the end of the text, of the words: "compatible with the minimum practicable impairment of marine ecology."

The text, as amended, was adopted.

Paragraph 34

Mr. ARORA (India) proposed that, instead of the amendments proposed by the USSR and Indian representatives at the previous meeting, the following words should be inserted at the beginning of the paragraph: "It was vitally emphasized that".

Mr. STASHEVSKY (Union of Soviet Socialist Republics) expressed regret that his delegation had not been consulted but did not oppose the Indian amendment.

The text, as amended, was adopted.

Paragraph 42

The CHAIRMAN recalled that it had been decided to delete the first sub-paragraph and invited the United States representative to read out a revised text, submitted after consultation with the Australian representative.

Mr. McKELVEY (United States of America) proposed the insertion, at the beginning of the remaining sub-paragraph, of the words: "It was suggested that", and the deletion of the words "royalty or taxation" in the latter part of the first sentence.

The text, as amended, was adopted.

Paragraph 44

Mr. PROHASKA (Austria), Rapporteur, read out the following revised text:

"Drilling and mining activities carried out on land present extreme hazards requiring strict and adequate safety measures. This is all the more true for all phases of marine mineral development, due to the hostile environment in which it takes place. Mineral exploration and extraction may interfere with fishing, while the use of dynamite in seismic exploration may kill fish locally. One single blow-cut may pollute vast expanses of the ocean, significantly upset the ecological balance and damage the traditional maritime activities. Since only a few countries have so far adopted national safety codes for oil drilling within their continental shelf area, the necessity of adopting such appropriate legislation in the interest of the world community was urgently stressed. It was also pointed out that, although the establishment of sea lanes and use of modern aids to navigation have largely eliminated interference with navigation, the increase in the number of fixed or stationary installations multiplies the number of obstacles shipping must face and calls for specific measures to solve conflicts arising from different uses of the sea."

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Mr. McKELVEY (United States of America) proposed the replacement of "interference with" in the final sentence by "hazards to".

Mr. LIVERMORE (Australia) suggested the insertion of "and even spread to neighbouring coasts and" after the words "expanses of the ocean".

Mr. FLEMMING (United Kingdom) proposed the deletion of "extreme" in the first sentence.

Mr. St. JOHN (Trinidad and Tobago) recalled that the representative of Thailand had requested the insertion, after the words "calls for" in the latter part of the paragraph, of the words "appropriate safeguards to prevent such hazards, as well as".

Mr. SAIGADO (Chile) said that he had requested the addition, at the end of the paragraph, of the words "and to protect the interests of coastal States".

The text, as amended, was adopted.

Paragraph 47

Mr. PROHASKA (Austria), Rapporteur, said that an amended text would be submitted after consultations among the Chilean, Peruvian and United Arab Republic representatives.

Paragraph 56

Mr. PROHASKA (Austria), Rapporteur, read out a sub-paragraph whose addition to paragraph 56 had been proposed: "It was also pointed out that the reliability of bathymetric and geological maps of the ocean floor depends on the accuracy of the navigation systems with which they are recorded. In the last thirty years, electronic navigation has made considerable progress through the use of satellites. Such means of navigation should be made available to the greatest possible number of users."

Two Argentine amendments were also before the Sub-Committee. The first would entail the replacement of the last two sentences by the following text:

"In the last thirty years, the development of electronic navigation has contributed to considerable progress. Today, this is enhanced by the precision attained on the high seas by the artificial satellite navigation system. Additionally, the very low frequency continued wave system promises vast coverage range and precise navigation resolution capacity. The need to

/...

(Mr. Prohaska, Austria)

support marine exploration surveying by means of precise navigation is felt predominantly in the southern oceanic hemisphere."

The second amendment would involve the replacement, in the second sentence of the revised text, of the words "through the" by "including the recent".

Mr. FLEMMING (United Kingdom) said that he would support any amendment which would dispel the impression that satellites had been in use for thirty years. He proposed the replacement of "predominantly... hemisphere" by "universally felt".

The CHAIRMAN requested the representatives of Argentina, the United States, Malta and the United Kingdom to prepare a revised text for paragraph 56.

Paragraph 58

Mr. PROHASKA (Austria), Rapporteur, said that the United Kingdom representative had proposed the deletion of the word "immediate". The Brazilian representative had suggested the insertion of "It was pointed out that" before "there should be" and the addition at the beginning of the final sentence of the words "The idea was put forward that".

Mr. PAVICEVIC (Yugoslavia) did not object to the wording of paragraph 58 but asked that his country's position should be noted. He requested the addition to the paragraph of a new sub-paragraph as follows:

"The freedom of exploration of the sea-bed should be accepted by all under the condition that this freedom has peaceful aims and that its goals should be beneficial to all, and that knowledge obtained through it should be available without discrimination, publicly to all, particularly bearing in mind the needs and interests of the developing countries."

The CHAIRMAN said that he had taken note of the Yugoslav statement.

The original text, as amended by the Rapporteur, was adopted.

Paragraph 59, first sub-paragraph

Mr. PROHASKA (Austria), Rapporteur, said that three proposals had been submitted to the Sub-Committee; the first was that the sub-paragraph should remain unchanged, the second was for the deletion of the words, at the beginning of the second sentence, "There is general agreement that", together with "governmental and academic", and the third was for the replacement of "freely accessible to all" by "circulated as broadly as possible".

After an exchange of views in which Mr. PARDO (Malta), Mr. STASHEVSKY (Union of Soviet Socialist Republics), Mr. FLEMMING (United Kingdom), Mr. NITTI (Italy) and Mr. ARORA (India) took part, the text of the first paragraph was adopted without amendment.

Paragraph 59, second sub-paragraph

Mr. PROHASKA (Austria), Rapporteur, read out the proposed amendments for the second sub-paragraph. There had been a suggestion that in the French text the words "avec la proposition selon laquelle on devrait consentir au exploitants des droits d'exploration exclusifs" should be replaced by the words "avec la proposition selon laquelle on pourrait consentir aux prospecteurs des permis exclusifs de recherches".

Miss MARTIN SANE (France) said that the amendment to the French text could be applied to those in other languages.

The French amendment was adopted.

The CHAIRMAN said that, if the Sub-Committee decided to adopt the first Chilean amendment to the effect that the sub-paragraph should begin with the words "If a system of concessions is adopted", the remainder of the text could be changed accordingly.

The first Chilean amendment was adopted.

Mr. FLEMMING (United Kingdom) said that he saw no reason to abandon the expression "after the lapse of a suitable period of time", which the Chilean representative proposed to delete.

Mr. LIVERMORE (Australia) thought that the words "such as" could be inserted after the words "basic data" and that the parentheses could be deleted.

Mr. McKELVEY (United States of America) supported that suggestion; examples, however, could be limited to seismic records. He also shared the United Kingdom representative's view regarding the second Chilean amendment.

/...

Mr. CROSBY (Canada) said it would be better not to include examples of basic data in the sub-paragraph. In particular, the reading of seismic records would require the use of suitable systems, and the distribution of such records would therefore be very restricted.

Mr. LIVERMORE (Australia) said he did not press his proposal regarding examples of basic data, but he reserved the right to speak again on that matter. He felt that third parties should be permitted to examine, in their own laboratories, cores obtained by a prospector, if the need arose.

The CHAIRMAN drew the Sub-Committee's attention to the amendment to delete the word "exclusive".

The amendment was adopted.

Mr. CABRAL de MELLO (Brazil) recalled that he had proposed that the words "granting of exploration rights" should be replaced by the words "the exploration and exploitation of the sea-bed and ocean floor".

Mr. LIVERMORE (Australia) and Mr. YANKOV (Bulgaria) felt that the mention of exploitation might prejudice further work.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) proposed the insertion, at the beginning of the second sentence, of the expression "It was also pointed out" in order to differentiate it clearly from the first.

The CHAIRMAN felt that that clarification should be included in order to show that the sentence in question reflected one of the views expressed.

The Soviet Union amendment was adopted.

Mr. SALGADO (Chile) noted that, in Chilean law, the system of concessions applied firstly to exploration. The Brazilian amendment would therefore complete the text suitably. It should be mentioned, however, that data should be made available within determined time-limits and not "after the lapse of a suitable period of time", which might involve undue delay. Furthermore, prospectors should be requested to supply copies, not originals.

The CHAIRMAN pointed out that the second sentence reflected only the views of certain delegations, but that the Chilean delegation's view would be taken into consideration.

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Mr. ARORA (India) proposed that the word "arrangements" should be replaced by the word "régime".

Following an exchange of views in which Mr. ARORA (India), Mr. CABRAL de MELLO (Brazil), Mr. de SOTO (Peru), Mr. HAQUE (Pakistan) and Mr. PARDO (Malta) took part, Mr. YANKOV (Bulgaria) expressed the view that the alteration suggested by India would not improve the text. In his view, the term "régime", unlike "arrangement", did not cover all the different rights and obligations which might arise from the granting of concessions.

Mr. ARORA (India) did not press his suggestion.

Paragraph 59, second sub-paragraph, as amended, was adopted.

Paragraph 60

Mr. PROHASKA (Austria), Rapporteur, said it had been proposed that the first two sentences of the paragraph should be replaced by the following text: "Existing international exchange of information and data is limited to scientific or academic data. There is a need for an international exchange of applied technological data". The Soviet delegation had proposed the deletion of the words "or academic" in the first sentence.

Mr. PARDO (Malta) noted, in regard to the last sentence, that the problem was to ascertain at what institutions the documentation should be registered. He proposed the insertion, in the English text, of the word "could" before the words "be registered".

Mr. MLADEK (Czechoslovakia) recalled that his delegation had proposed that maps and basic documentation should be registered with the Intergovernmental Oceanographic Commission.

The amendments were adopted.

Paragraph 60, as amended, was adopted.

Paragraph 61

Mr. PROHASKA (Austria), Rapporteur, said it had been proposed that the words "The view was however expressed" should be inserted at the beginning of the second sentence and that the words "a relatively detailed" should be inserted before the words "basic survey".

The amendments were adopted.

Paragraph 61, as amended, was adopted.

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Paragraph 62

Mr. PROHASKA (Austria), Rapporteur, read out the text of an amendment designed to reword the second sentence as follows: "In this respect, the policy should be to pursue the systematic gathering of basic knowledge of areas already known to show signs of potential mineralization". It had furthermore been proposed to replace "the policy should be" by "it might be better".

The first amendment was adopted.

Paragraph 62, as amended, was adopted.

Paragraph 63

Mr. PROHASKA (Austria), Rapporteur, said that the United Kingdom had proposed the addition of the words "for some minerals" before the words "it would seem".

The amendment was adopted.

Paragraph 63, as amended, was adopted.

Paragraph 63 (a) (new paragraph)

Mr. PROHASKA (Austria), Rapporteur, read out the text of a proposed new paragraph:

"At the same time, however, it is desirable to pursue purely scientific sea-bed exploration, for large areas of this vast domain are not well enough known to understand its potential even qualitatively. It is also desirable to continue research on crystal and oceanologic processes of the deep ocean, for an understanding of these processes is fundamental to learning what mineral concentrations are likely to exist in this environment."

Mr. PARDO (Malta) felt that the wording placed too much stress on minerals. He suggested that the word "science" should be inserted before the word "learning" at the end of the paragraph.

Mr. LIVERMORE (Australia) proposed that the final phrase should be retained, with the addition of the word "science".

The proposal was adopted.

The new paragraph, as amended, was adopted.

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Paragraph 64

Mr. PROHASKA (Austria), Rapporteur, said Argentina had proposed that the words "at the regional or international level by Governments or non-governmental organizations and" should be inserted after "co-ordinated".

In reply to a question put by Mr. PARDO (Malta), Mr. PROHASKA (Austria), Rapporteur, said that paragraph 64 indicated certain means calculated to facilitate the definition of the areas and resources which were mentioned in paragraph 63 and which should be considered to merit priority.

Mr. PARDO (Malta) felt that the wording should reflect that fact and should take into account other possible priorities.

The CHAIRMAN pointed out that priorities would be defined in the basic document.

The Argentine amendment was adopted.

Paragraph 64, as amended, was adopted.

Paragraph 65

Mr. OLISEMEKA (Nigeria) proposed that the first part of the sentence should read as follows: "The need was stressed to associate developing countries more fully and without delay in this new venture"; the word "vast" should be inserted before the word "possibilities", and the words "the necessary means and" after the word "provide".

The amendments were adopted.

Paragraph 65, as amended, was adopted.

Paragraph 66 (a)

Paragraph 66 (a) was adopted.

Paragraph 66 (b)

Mr. PROHASKA (Austria), Rapporteur, said that two amendments had been submitted to paragraph 66 (b). One would delete the second sentence, and the other would replace the expression "marine environment" by the word "sea-bed".

Mr. McKELVEY (United States of America) pointed out that the survey in question necessarily encompassed the sea-bed.

/...

Mr. FLEMMING (United Kingdom) said that he was prepared to support either of the two amendments.

Mr. PARDO (Malta) proposed that the second sentence should be deleted.

It was so decided.

Paragraph 66 (b), as amended, was adopted.

Paragraph 66 (c)

Mr. GRANELLI (Argentina) proposed the insertion, after the words "methods used for survey", of the words "providing, where they are lacking, precise navigation systems which can be used under any weather or oceanic conditions". Reference could then be made to "analysis and the use of computation systems with a view to processing oceanographic data of practical and industrial value".

Mr. McKELVEY (United States of America) wondered whether a reference to computation systems was appropriate in the paragraph under discussion.

The CHAIRMAN suggested that the Argentine delegation, in collaboration with the United States representative, should submit a more concise formulation to the Rapporteur.

It was so decided.

Paragraph 66 (d)

Mr. GRANELLI (Argentina) said that he would like the words "and in accordance with the practices of international law" to be inserted after "scientific research".

Mr. de SOTO (Peru) proposed that the Argentine amendment should be modified to read: "and in accordance with the relevant provisions of international law".

It was so decided.

Miss MARTIN SANE (France) proposed that the words "circulated as broadly as possible" should be replaced by "freely accessible to all", as in paragraph 59.

It was so decided.

Paragraph 66 (d), as amended, was adopted.

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Paragraph 66 (e)

Mr. PROHASKA (Austria), Rapporteur, said that the following text had been proposed: "However, development of some of the mineral resources of the ocean floor does not have to await complete topographic and geologic knowledge of the ocean floor."

Paragraph 66 (e), as amended, was adopted.

Paragraph 66 (f)

Mr. PROHASKA (Austria), Rapporteur, said it had been suggested that the words "would encourage" should be replaced by "should encourage".

The amendment was adopted.

Mr. PARDO (Malta) proposed that the word "should" in the third line should be replaced by "could".

It was so decided.

Paragraph 66 (f), as amended, was adopted.

Paragraph 66 (g)

Miss MARTIN SANE (France) proposed that the phrase "operators who are granted exclusive exploration rights" should be replaced by the word "prospectors". In the French text, the word "gratuitement" should be replaced by "librement".

It was so decided.

Mr. de SOTO (Peru) noted that the same change should be made in the Spanish text.

Mr. PROHASKA (Austria), Rapporteur, said it had been proposed that the words "should also be requested" should be replaced by "might also be required", and the word "available" by "accessible".

The amendments were adopted.

Paragraph 66 (g), as amended, was adopted.

Paragraph 67

Mr. PROHASKA (Austria), Rapporteur, proposed that in the English text the word "ascertained" should be replaced by "discovered".

It was so decided.

Paragraph 67, as amended, was adopted.

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Paragraph 68

Mr. PROHASKA (Austria), Rapporteur, said it had been proposed that the words "Members of the Committee suggested that" should be inserted at the beginning of the paragraph.

The CHAIRMAN suggested that that wording should be replaced by "It was suggested that".

It was so decided.

Mr. PROHASKA (Austria), Rapporteur, said it had been suggested that the word "may" in the third line of the English text should be replaced by "might".

The amendment was adopted.

Mr. LIVERMORE (Australia) proposed that the last sentence of the paragraph should be amended to read: "The identification of common denominators amongst these practices might facilitate the acceptance by the international community of an agreed procedure."

It was so decided.

Mr. McKELVEY (United States of America) proposed that the following sentence should be added at the end of the paragraph: "But it should also be recognized that the terms appropriate for mineral resources allocation and development vary from place to place and time to time."

It was so decided.

Mr. ARORA (India) proposed that the word "arrangements" in the sixth line should be replaced by "régime".

Mr. FLEMING (United Kingdom), supported by Mr. YANKOV (Bulgaria) and Mr. McKELVEY (United States of America), said he felt that, in the interests of precision, it would be inappropriate to use the word "régime" in that case.

Mr. NITTI (Italy) proposed that the words "the optimum efficiency of the arrangements" should be amended to read simply "optimum efficiency".

It was so decided.

Paragraph 68, as amended, was adopted.

The meeting rose at 1.10 p.m.

SUMMARY RECORD OF THE FOURTEENTH MEETING

Held on Thursday, 27 March 1969, at 3.15 p.m.

Chairman:

Mr. DENORME

Belgium

later,

Mr. ARORA

India

/...

ADOPTION OF THE INTERIM REPORT (A/AC.138/SC.2/4 and Add.1) (concluded)Paragraph 56

Mr. PROHASKA (Austria), Rapporteur, read out a text that had been agreed to by the delegations of the United States and Argentina after the 13th meeting.

Paragraph 56, as amended, was adopted.

Paragraph 65

Mr. PROHASKA (Austria), Rapporteur, read out a new text for paragraph 65 and suggested that that paragraph should be incorporated in paragraph 66.

It was so decided.

Paragraph 66

Mr. PROHASKA (Austria), Rapporteur, introduced an amendment to sub-paragraph (c).

Sub-paragraph (c), as amended, was adopted.

Mr. PROHASKA (Austria), Rapporteur, said that it was proposed to add the following new sentence to sub-paragraph (f): "Reference was made to the continental margin".

Mr. PARDO (Malta) said he considered the new sentence too vague.

Mr. GRANELLI (Argentina) said that it was important to use accurate descriptions and pointed out that the continental shelf and the continental slope were both part of the continental margin. All three areas of priority had been discussed by the Sub-Committee.

Mr. FLEMMING (United Kingdom), agreeing, said that the draft of sub-paragraph (f) mentioned only two of the areas referred to in discussion as priority areas for the establishment of basic documents. A third area had been referred to, the continental margin, and it also should be mentioned.

Mr. PARDO (Malta) proposed that the words "beyond national jurisdiction" should be added to the new sentence.

Mr. FLEMMING (United Kingdom) said that he objected to those words on the ground that the Sub-Committee would not want to rule out that the survey might

(Mr. Flemming, United Kingdom)

extend to some aspects of the continental shelf within the limits of national jurisdiction.

The CHAIRMAN suggested that the delegations of Malta, Argentina and the United Kingdom should hold consultations with a view to drafting a new text for sub-paragraph (f).

It was so agreed.

Mr. PROHASKA (Austria), Rapporteur, read out a text for sub-paragraph (f) that had been agreed upon in informal consultations between the delegations of Malta, Argentina and the United Kingdom.

Paragraph 66, as amended, was adopted.

Paragraphs 67 and 68

Mr. PROHASKA (Austria), Rapporteur, introduced an amendment to paragraph 67 and several amendments to paragraph 68.

Paragraphs 67 and 68, as amended, were adopted.

Paragraphs 69, 70 and 71

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to each of the paragraphs.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) read out the text of a qualifying introductory sub-paragraph to paragraph 69, which was intended to avoid giving the impression that paragraph 69 represented the views of the Sub-Committee as a whole.

Mr. LIVERMORE (Australia) supported the Soviet representative's proposal and suggested that the existing paragraphs 69, 70 and 71 should become sub-paragraphs (a), (b) and (c), respectively, of paragraph 69 and be inserted immediately after the introductory sub-paragraph read out by the representative of the Soviet Union.

It was so decided.

Paragraphs 69, 70 and 71, as amended, were adopted with minor drafting changes.

Paragraph 72

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Mr. LIVERMORE (Australia), supported by Mr. CROSBY (Canada) and Mr. STASHEVSKY (Union of Soviet Socialist Republics), suggested that the paragraph, as amended, should begin with a qualifying phrase.

Mr. PANYARACHUN (Thailand) said that he preferred the original wording "respective Governments" to the wording "individual Governments" in the amended version of the paragraph.

Mr. PROHASKA (Austria), Rapporteur, read out a new text that had been agreed upon in informal consultations.

Paragraph 72, as amended, was adopted.

Paragraph 73

Mr. PROHASKA (Austria), Rapporteur, introduced two amendments to the paragraph.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) suggested that a qualifying phrase should be inserted at the beginning of the paragraph.

Paragraph 73, as amended, was adopted.

Paragraphs 74-76

Mr. PROHASKA (Austria), Rapporteur, introduced various amendments to the paragraphs.

Paragraphs 74-76, as amended, were adopted.

Paragraph 77

Mr. PROHASKA (Austria), Rapporteur, introduced various amendments to the paragraph.

Mr. ARORA, supported by Mr. PARDO (Malta), Mr. SALGADO (Chile), Mr. IMAM (Kuwait) and Mr. PAVICEVIC (Yugoslavia), said that, for the sake of consistency, the words "such arrangements are" in sub-paragraph (c) should be replaced by the words "such a régime is".

Mr. FLEMMING (United Kingdom), supported by Mr. LIVERMORE (Australia), pointed out that as the word "arrangements" was used differently in that sub-paragraph than it was elsewhere in the draft report, the use of the word "régime" would be inappropriate.

Mr. LIVERMORE (Australia) suggested that sub-paragraphs (b) and (c) should be amalgamated and that the word "system" might be used as a compromise.

Mr. de SOTO (Peru) said that there was a substantial difference in content as between the two sub-paragraphs: sub-paragraph (b) dealt with the rights and obligations of operators, and sub-paragraph (c) with the interests of mankind as a whole.

The CHAIRMAN suggested that delegations should hold informal consultations with a view to agreeing on a text for sub-paragraph (c) and that the delegations of Chile and Mexico should endeavour to produce a joint version of sub-paragraph (d).

Mr. PROHASKA (Austria), Rapporteur, read out a new text for paragraph 77 that had been agreed upon in informal consultations between the delegations concerned.

Paragraph 77, as amended, was adopted.

Paragraph 78

Paragraph 78 was adopted.

Mr. PROHASKA (Austria), Rapporteur, read out five new paragraphs which it was proposed to insert after paragraph 78.

New paragraph 79

The new paragraph 79 was adopted with minor drafting changes.

New paragraph 80

Mr. STASHEVSKY (Union of Soviet Socialist Republics) proposed that the new paragraph 80 should not form a separate paragraph but should be added to paragraph 79.

It was so decided.

The new paragraph 80, as amended, was adopted.

New paragraph 81

The new paragraph 81 was adopted with minor drafting changes.

New paragraph 82

The new paragraph 82 was adopted with drafting changes.

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New paragraph 83

The CHAIRMAN suggested that delegations should hold informal consultations, with a view to agreeing on a revised version of the paragraph.

Mr. PROHASKA (Austria), Rapporteur, read out a revised version of the paragraph that had been agreed upon in informal consultations among the delegations concerned.

The new paragraph 83, as amended, was adopted.

Paragraph 79

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Paragraph 79, as amended, was adopted with minor drafting changes.

Paragraph 80

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) proposed that the paragraph should be deleted.

It was so decided.

Paragraph 81

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Paragraph 81, as amended, was adopted.

Paragraph 82

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

The CHAIRMAN suggested that the delegations which had submitted amendments to the paragraph should hold informal consultations in an effort to draft a joint text.

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Mr. PROHASKA (Austria), Rapporteur, read out a revised version of the paragraph that had been agreed upon in informal consultations among the delegations concerned.

Paragraph 82, as amended, was adopted.

Paragraph 83

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Paragraph 83, as amended, was adopted with minor drafting changes.

Mr. Arora (India), Vice-Chairman of the Sub-Committee, took the Chair.

Paragraph 84

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraph.

Paragraph 84, as amended, was adopted with minor drafting changes.

Mr. PROHASKA (Austria), Rapporteur, read out the text of various amendments and drafting changes to the paragraph.

Mr. ARORA (India) said that he found the reference to an "international bureaucracy" in the final sentence illogical, since there had been no previous mention in the paragraph of an international régime.

Mr. LIVERMORE (Australia) said that the reference in question was based on a statement by his delegation. While he recognized the need for an international régime whose operation would require skilled staff, it was most important that the benefits accruing from ocean floor production should not be absorbed by a cumbersome bureaucracy. He proposed that the words "regulatory authority" in the first sentence and "international bureaucracy" in the final sentence should be replaced in each case by "international régime".

It was so decided.

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Mr. PROHASKA (Austria), Rapporteur, read out a new version of paragraph 85 that had been agreed upon in informal consultations among the delegations which had submitted amendments.

Paragraph 85, as amended, was adopted.

Paragraphs 86 and 87

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraphs.

Paragraphs 86 and 87, as amended, were adopted.

Paragraphs 88, 89 and 90

Mr. PROHASKA (Austria), Rapporteur, introduced several amendments to the paragraphs.

Paragraphs 88, 89 and 90, as amended, were adopted with minor drafting changes.

Mr. Denorme (Belgium) resumed the Chair.

Paragraph 91

Mr. PROHASKA (Austria), Rapporteur, introduced two amendments to the paragraph.

Mr. LIVERMORE (Australia) proposed that the first sentence should be replaced by the following text: "It was suggested that any international resource management system, in granting exploitation rights for particular minerals, would need to take into account the supply and demand position of those minerals produced from land and their availability in world markets."

Mr. de SOTO (Peru) said that he found the wording of the Australian proposal somewhat restrictive. The price of primary commodities was determined by many factors in addition to the supply and demand position. He would prefer a more broadly-based text.

After a discussion in which Mr. YANKOV (Bulgaria), Mr. McKELVEY (United States of America), Mr. STASHEVSKY (Union of Soviet Socialist Republics), Mr. FLEMMING (United Kingdom), Mr. PARDO (Malta), Mr. IMAM (Kuwait), Miss MARTIN SANE (France), Mr. HAQUE (Pakistan), Mr. MEYER PICON (Mexico) and Mr. LIVERMORE (Australia) took part, Mr. PROHASKA (Austria), Rapporteur, proposed

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(Mr. Prohaska, Austria)

that the first sentence of paragraph 91 should be replaced by the following text:
"It was suggested that in providing exploitation rights for particular minerals, account would need to be taken of the availability on world markets of these same minerals produced on land, the demand position and other relevant factors."

The CHAIRMAN said that, if there was no objection, he would take it that the Sub-Committee accepted the text proposed by the Rapporteur.

It was so decided.

Paragraph 91, as amended, was adopted.

Paragraphs 92-95

Mr. PROHASKA (Austria), Rapporteur, introduced various amendments to the paragraphs.

Paragraphs 92-95, as amended, were adopted.

Paragraph 96

Paragraph 96 was adopted.

Paragraphs 97-99, 100 (a) and 100 (b)

Mr. PROHASKA (Austria), Rapporteur, introduced various amendments to the paragraphs.

Paragraphs 97-99, 100 (a) and 100 (b), as amended, were adopted.

Paragraph 100 (c)

Mr. PROHASKA (Austria), Rapporteur, introduced various amendments to the paragraph.

Mr. ARORA (India), supported by Mr. de SOTO (Peru), said that as the reference to a "responsible authority" had been deleted from paragraph 100 (b), the words "international bureaucracy" should be deleted from the paragraph under consideration. It was not appropriate to speak of a bureaucracy if no mention had been made of some type of international machinery.

Mr. NITTI (Italy) felt that it would be useful to retain the notion of an international bureaucracy and asked whether the words "bureaucratic impediments" would be more acceptable.

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Mr. ARCHER (United Kingdom), supported by Mr. McKELVEY (United States of America) and Mr. YANKOV (Bulgaria), said that the present wording of paragraph 100 (c) reflected the views expressed during the Sub-Committee's discussions and should therefore be retained in the report.

Mr. ARORA (India) said that while he had no objection to the suggestion made by the Italian representative, a further change would be required in paragraph 100 (b). As, however, the whole question of an international bureaucracy had been adequately dealt with in the revised version of paragraph 85, he proposed the deletion of paragraph 100 (c).

It was so decided.

Paragraph 100 (d)

Mr. PROHASKA (Austria), Rapporteur, introduced two amendments to the paragraph.

Paragraph 100 (d), as amended, was adopted.

Paragraph 100 (e)

Paragraph 100 (e) was adopted.

Paragraph 100 (f)

Mr. PROHASKA (Austria), Rapporteur, introduced an amendment to the paragraph.

Mr. McKELVEY (United States of America) proposed that the paragraph should be replaced by the following text: "There was common understanding that all countries should participate to the extent possible in the exploration and exploitation of the resources of the ocean floor."

Mr. GAUCI (Malta) said that it was not possible in practice for all countries to participate fully in the exploration and exploitation of the resources of the ocean floor.

Mr. ARCHER (United Kingdom) said that the Sub-Committee had in fact discussed methods whereby the developing countries could achieve such participation.

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Mr. STASHEVSKY (Union of Soviet Socialist Republics) said that it would be better if the words "There was common understanding that" were omitted.

Mr. GAUCI (Malta) said that, as the result of informal consultations, it had been agreed that the words "and share equitably in their exploitation" should be inserted at the end of the United States amendment.

It was so decided.

Paragraph 100 (f), as amended, was adopted.

Paragraphs 100 (g) and (h)

Mr. PROHASKA (Austria), Rapporteur, introduced amendments to the paragraphs.

Paragraphs 100 (g) and (h), as amended, were adopted.

Paragraph 100 as a whole, as amended, was adopted.

Mr. YANKOV (Bulgaria) proposed the deletion of the words "the economics involved in", in the heading preceding paragraph 78 and the deletion of the sub-titles preceding paragraphs 79, 84, 89 and 95.

It was so decided.

Mr. PROHASKA (Austria), Rapporteur, said that the Peruvian delegation had proposed the addition of a new paragraph after paragraph 100 to be worded as follows: "It was pointed out that the problems raised during the discussion of item 2 on the Work Programme would have to be re-examined in the light of the forthcoming report of the Secretary-General pursuant to resolution 2467 C (XXIII)."

Mr. LIVERMORE (Australia) proposed that the words "and subsequently in the devising of an international régime" should be inserted at the end of the Peruvian text.

After a discussion in which Mr. FLEMMING (United Kingdom), Mr. ARORA (India), Mr. IMAM (Kuwait), Mr. de SOTO (Peru) and Mr. LIVERMORE (Australia) took part, the CHAIRMAN suggested that the new paragraph should read as follows: "It was pointed out that the problems raised during the discussion of item 2 on the Work Programme would have to be considered further in the light of the forthcoming report of the Secretary-General pursuant to resolution 2467 C (XXIII)

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(The Chairman)

and subsequently in the devising of an international régime." He further proposed that it should be inserted as a new paragraph after paragraph 30 of the interim progress report.

It was so decided.

The interim progress report (A/AC.138/SC.2/4 and Add. 1) as a whole, as amended, was adopted.

Mr. STASHEVSKY (Union of Soviet Socialist Republics) said that, throughout the preceding debate, his delegation had consistently stressed that the content of document A/AC.138/SC.2/4/Add.1 represented only the views of individual members of the Sub-Committee, together with examples of national measures designed to encourage the exploration and exploitation of the natural resources of the sea-bed beyond the limits of national jurisdiction. Future consideration of such examples was obviously not excluded. His delegation nevertheless emphasized that the complexities of the issues debated had been such as to preclude their full discussion and that, consequently, the Sub-Committee had not been able to reach any conclusions.

His Government's position with regard to the establishment of any international machinery for the exploration and exploitation of the resources of the sea-bed beyond the limits of national jurisdiction had been fully stated at the twenty-third session of the General Assembly. His delegation had not objected to the inclusion in the report under consideration of references to the possible powers of such machinery, on the clear understanding that those references were no more than a reflection of the views of individual delegations. His delegation had taken note of the Chairman's statement concerning the preliminary nature of the report.

The CHAIRMAN said that the problems raised by the exploration and exploitation of sea-bed resources beyond the limits of national jurisdiction were so numerous and so complex that the 1968 report of the Economic and Technical Working Group was little more than a summary of information together with qualified conclusions. Nevertheless, the cautious optimism expressed by the Ad Hoc Committee with regard to new drilling, dredging and mineral extraction techniques had been vindicated in the course of the Sub-Committee's debates.

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(The Chairman)

The primary duty of the Sub-Committee, however, was to study the ways and means of promoting the exploitation and use of the resources of the sea-bed and the ocean floor, and the subsoil thereof, beyond the limits of national jurisdiction, and of international co-operation to that end, bearing in mind the fact that such exploitation should benefit mankind as a whole. Its performance of that task had been greatly facilitated by the Working Group's excellent report and by the preliminary note by the Secretariat (A/AC.138/6 and Corr.1). The Sub-Committee had done well to adopt the Indian proposal that the Secretariat should be requested to prepare a study on the action being taken by Governments with respect to activities on the continental shelf within their jurisdiction (A/AC.138/SC.2/SR.11 pp. 8, 9).

Although the Sub-Committee had not had time to examine in detail the suggestions that had been submitted, its interim progress report would give the appropriate details and enable delegations and Governments to make preparations for the August session. Such preparations would also be facilitated by the publication of the programme of work, which, at the suggestion of the representative of the United Arab Republic, he had now completed. It would, he hoped, lead to the initial stages of the August session being completed rapidly. Since it was clear that delegations attached great importance to the study on the question of establishing international machinery requested under General Assembly resolution 2467 C (XXIII), it should be pointed out that the order in which the programme of work was arranged carried no implications of priority and that more specific sub-headings might have to be added later on.

CLOSURE OF THE SESSION

The CHAIRMAN declared the session of the Economic and Technical Sub-Committee of the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction closed.

The meeting rose at 9 p.m.
