

advantages of pulverized fuel without most of its disadvantages. Thus internal combustion engines can be designed to use pulverized coal, but they are not likely to displace oil-fired engines. Similarly, technical success has been achieved in firing marine boilers with pulverized coal, but it has failed to check the tendency to change over from coal to oil. On the other hand, work now in progress in Switzerland and in the United States suggests that it may find a new field in the gas turbine, for both stationary use and for locomotives. It is particularly interesting to learn that it is expected that two full-scale gas turbine locomotives using pulverized fuel will be in operation in the United States by next spring.

## INTERNATIONAL CONFERENCE FOR THE PROTECTION OF NATURE

**A**N International Conference for the Protection of Nature was held at Brunnen, Switzerland, during June 28–July 3, and was attended by sixty-six delegates representing twenty-two countries. Dr. Charles Jean Bernard, president of the Swiss League for the Protection of Nature, was elected president of the Conference, and Prof. Maurice Caullery and Dr. J. Ramsbottom were elected vice-presidents.

It was soon apparent that there was a divergence of opinion concerning both the status of the Conference and the effective steps which could be taken to fulfil its purpose. Many delegates apparently were authorized by their respective Governments to give assent to a draft constitution establishing a permanent inter-governmental Union, whereas others had no official status, as they merely represented societies.

The present position can best be understood from a summary of what had previously occurred. At the Eighth International Zoological Congress at Graz in 1910, Dr. Paul Sarasin raised the question of world-wide Nature protection. A committee was formed which requested the Swiss Government to convene an International Conference. This Conference was held at Berne in 1913, and established an Advisory Commission for the International Protection of Nature, with its centre at Basle. A draft convention was drawn up and signed by the delegates of the seventeen countries represented, but the outbreak of war left it in the air as only nine countries had then ratified it, though five additional signatures were added by December 1914. An attempt was made to revive the Commission at the First International Conference for the Protection of Nature held at Paris in 1923, but failed, presumably because the signatories included ex-enemy countries, whereas Great Britain, France and the United States had not ratified it. In 1928 an International Office for the Protection of Nature was started at Brussels, sponsored by the Governments of France, Belgium, Belgian Congo, Netherlands, Netherlands Indies, Poland and Germany; the Office, which acts as a central office for information, was transferred to the Colonial Institute at Amsterdam in 1945. During the War it suffered many vicissitudes, but is now resuming its activities.

Mention should also be made of the Convention for the Protection of the Fauna and Flora of Africa, resulting from the London Conference of 1933, and a similar one for the Americas; the International Committee for Bird Preservation; and the inter-

national agreement preventing the over-fishing of whales.

The Swiss League invited a number of representatives of interested foreign societies to visit the Swiss National Park and other Nature reserves in 1946. So good a response was received that they decided to hold a meeting at Basle, when opportunity was taken to discuss general problems. The necessity for an active organisation was agreed upon, and the Swiss League was asked to arrange an International Conference this year. The difficulties of doing this were apparently not at first realized.

When invitations were received in Great Britain, the Society for the Promotion of Nature Reserves called meetings of representatives of interested societies and discussed the various points which needed clarification. M. J. Büttikofer, secretary of the Swiss League, attended the first meeting and gave an account of the League's general attitude and Dr. J. H. Westermann a second one, and explained the present position of the International Office. There was unanimous agreement that the Conference called for Brunnen, if held, could be regarded only as exploratory, and that the United Nations Educational, Scientific and Cultural Organisation should be asked to call an International Congress at Paris next year. Their view was later embodied in a series of motions which the British delegates (J. Ramsbottom, N. D. Riley, the Hon. Miriam Rothschild and G. F. Herbert Smith) presented to the Conference.

It was obvious that if a decision were taken immediately the Conference might end with its first meeting, for the delegates were apparently equally divided regarding the authority of the Conference to adopt an international code. It was agreed, therefore, to leave all debatable matters to the final session and to proceed with the drawing up of a draft constitution. A drafting committee was set up under the chairmanship of Dr. G. F. H. Smith. The draft constitution was finally adopted unanimously. Of the nine articles, only that dealing with objects and functions is of immediate interest. This reads

(1) The Union shall encourage and facilitate international co-operation between Governments, national and international organisations and persons interested in the protection of Nature and natural scenery.

(2) The Union shall promote and recommend national or international action in respect to: (a) scientific research relating to the protection of Nature; (b) the spread of public knowledge about the protection of Nature; (c) the improvement of educational methods best suited to teach the people of the world and especially the children the importance of the protection of Nature; (d) co-operation for regional planning with due regard to the principles of the protection of Nature; (e) the creation and conservation of national parks, Nature reserves and natural scenery; (f) the preservation of wild life and its natural environments; (g) the preparation of a world-wide convention for the protection of Nature.

(3) The Union shall collect, analyse, interpret and disseminate information about the protection of Nature.

(4) The Union shall publish and distribute to Governments, national or international organisations concerned with and persons interested in the protection of Nature, documents, legislative texts, scientific studies and information of any kind regarding the protection of Nature and especially the preservation of fauna, flora, natural scenery and natural monuments.

As was to be expected, the general discussions provided evidence of the need for a wide view of the problems of Nature protection. Thus, a remark made in submitting the British proposals that Nature protection meant not only the preservation of communities of plant and animal and the amenities, but might also affect man's welfare and even his existence, was expanded by Mr. G. Brewer, of the New York Zoological Society, with specific examples from the American continent which illustrated what may be termed the global view, and Governor G. C. Guibet, of the French Colonial Service, who stressed the political aspects.

The wisdom of postponing discussion of controversial matters until the end of the meeting gradually became obvious, and what amounted to a well-organised opposition to the 'obstructional' attitude attributed to the British delegates was so far converted by the realization that all had the same object in view and that no time had been lost during the Conference, that little difficulty was found in making the few adjustments necessary for complete agreement. The proceedings on the last morning were soon concluded. It was unanimously agreed that the Swiss League should continue to act as the agent for the provisional organisation and to carry out all necessary business as provided for by the provisional constitution. The League shall immediately send the draft constitution to the United Nations Educational, Scientific and Cultural Organisation asking for it to be transmitted to all Governments inviting them to communicate to the Organisation whether they can accept the draft constitution with or without amendments. The Organisation is requested to convene a Congress at Paris in July 1948 to discuss and finally accept a constitution based on the draft constitution. A request is to be sent to the Swiss Government asking that it shall communicate with the signatories of the 1913 Convention asking for its cancellation.

All that remained was for the Conference to pass a well-earned vote of thanks to Dr. Bernard for the excellent way in which he had presided, and to the Swiss League and its officers for their hospitality, initiative and labours.

Further matters call for comment. An international committee was formed to consider the various terms used in Nature protection, to collate national usages and formulate an international nomenclature.

Dr. R. Videsott gave an account of the Italian National Park at Gran Paradiso. At present there are nine hundred chamois and six hundred ibex protected by sixty gamekeepers. Owing to lack of funds, the Ministry of Agriculture and Forestry has had to discontinue the maintenance of the gamekeepers, and unless private subscriptions are available this most important European game reserve will be denuded of its treasures.

One of the societies sending delegates to the Conference was the *Nederlandse Jengdbond voor Natuurstudie*, a youth organisation with four thousand members between the ages of twelve and twenty-three, which has the protection of Nature as one of its main aims. It has a central office and eighty-five subsidiary centres, and a very efficient organisation with camps, lectures and its own periodical.

At the end of the Conference the majority of the delegates spent several days visiting the Swiss National Park. To their dismay they learned that there is a proposed scheme for a hydro-electric

installation which will dam up the streams in the upper reaches of the Park and inevitably convert this famous forest region into a stony wilderness. Swiss naturalists are not alone in asking *cui bono?* They saved the Lac de Sils, menaced by commercial development, after indemnifying the local communes by the profits from the unrestricted sale of chocolate medals—chocolate then being rationed—and had sufficient funds over to construct a research laboratory. May the public interest again be successfully brought to bear, for the preservation of its National Park means not only the retention of a beauty spot with its fauna and flora, but also the continuance of a living laboratory rich with promise of data valuable for the proper development of the country's forests.

J. RAMSBOTTOM

## MICROSEISMS AND ATMOSPHERIC OSCILLATIONS

By ERNEST TILLOTSON

THE surface of the earth is in constant movement with amplitudes of a few thousandths of a millimetre, and this movement is picked up and registered by instruments set up to record the passage of waves caused by earthquakes. An earthquake starts from a definite focus, but a microseism is any ground movement which has not been started by an earthquake. Bertelli, who first used the name 'microseism' in 1878, probably intended the name to cover only those waves of  $5 \pm 2$  sec. period which were somewhat regular in character and which, beginning with small amplitudes, grew in intensity and then died out in a length of time up to a few days.

The Japanese at one time considered microseisms to be stationary waves; but J. J. Shaw and others showed that they are progressive waves. They have a velocity of 2.5–3.5 km./sec. Lee did a considerable amount of work on microseisms and came to the conclusion that they were largely composed of Rayleigh waves. He then attempted to use this fact ("On the Direction of Approach of Microseismic Waves", *Proc. Roy. Soc. London, A*, **886**, 183; 1935) to find the direction from which the microseismic waves were approaching the observatory, Lee assumed them to be Rayleigh waves and noted the phase differences on the three-component seismographs. Thus if Rayleigh waves were approaching from the north, the sequence of ground movement should be up north down south; if from the south, the sequence should be up south down north, and so on. Lee had some difficulty, as he found the phase differences between the components of the microseisms to be variable, although the values appropriate to the general direction of approach were dominant. He used the dominant direction so obtained. His difficulties were probably due to the approaching microseisms not being completely Rayleigh waves, as there was some motion across the direction of propagation. Rayleigh waves were, however, dominant.

On account of the exigencies of war service, this work was not continued; but Lee and also J. J. Shaw were definitely of the opinion that the character of microseisms was influenced by geological structure. Banerji and Zanon thought not. Geological faults hinder the passage of microseisms in the Caribbean,