distillation proceeded quietly and regularly. The distillate consisted of 'a mixture of hydrocarbon oils, of a dark brown color, and a peculiar disagreeable odor.' In consistency, 'this mixture did not differ much from the crude coal-oil which is obtained by distilling rich cannel coals.'

"'The crude hydrocarbon oil was rectified by first distilling it in a slow current of steam, then treating the distillate successively with oil of vitriol and a solution of caustic soda in the usual way, and again distilling in steam as before. The refined product so closely resembled refined coal-oil and petroleum in odor, color, and illuminating properties, that it could hardly be distinguished from these.'

"The crude oil thus secured was distilled, and a naphtha, 'a mobile liquid of light, lemon yellow color, and peculiarly nauseous odor,' was obtained. From this in turn, on repeated distillation, a series of sixteen bodies with definite but different boiling points and specific gravities, separated out. These included benzol, toluol, xylol and other now well-known hydrocarbons, that are derived from destructive distillation of crude petroleum. They further were able to compare these results with a similar series secured from like study of Rangoon petroleum.

"Warren and Storer therefore deserve fullest credit for thus blazing the way in a skilful manner, toward a true explanation of the evolution of many hydrocarbon products from their primitive source, namely fish-oil."

The present writer would now ask Mr. Berl: "Does he, or does he not, consider that the above experimenters carried out the series of experiments as described, and if so does he accept their results as explaining in a satisfactory manner the possible origin of petroleum and numerous related chemical bodies from "the heat decomposition of fish"?

But many years after publication of their results, Engler experimented with the same fish-oil and concluded that such is capable of yielding large supplies of petroleum. Still more recently investigators in this and other countries have shown that production of petroleum from fishes can "be substantiated by experiments." The present writer then fully accepts and defends the correctness of his aphorism, "Fishes the Source of Petroleum." For unless Berl or others can prove that the colossal supplies of free oil already utilized, shamefully wasted or still in natural storage can be clearly traced to some other and natural source, he is compelled to adhere to the truth of the above aphorism.

JOHN MUIRHEAD MACFARLANE

SOCIETIES AND MEETINGS

THE SECOND ALL-SOVIET MATHEMATICAL CONGRESS

FROM June 24 to 30, 1934, there took place in Leningrad the second All-Soviet Mathematical Congress, the first of which was held in Kharkov (Ukraine) in 1930. The sessions met in the buildings of the Academy of Sciences of the U.S.S.R. and of the University of Leningrad. This is an imposing and historical group on the right bank of the Neva facing the center of earlier court and administrative activities (Winter Palace, Admiralty, St. Isaac's Cathedral) on the other bank. There were nearly six hundred delegates from all institutions of learning of the U.S.S.R., but the undersigned was the only non-Soviet participant. Some 230 papers were presented in the nine sections (algebra and number theory, geometry, topology, analysis (2), mathematical physics, probabilities, approximations, history and philosophy of mathematics) and, in the plenary sessions, the following addresses were given by invitation:

I. M. Vinogradof, "Waring's Problem."
P. S. Alexandrov, "The Relations between Algebra and Topology."
V. I. Smirnov, "Certain Contributions of the Leningrad School in Analysis and its Applications."
A. O. Gelfond, "The Theory of Transcendental Numbers."
N. G. Tchebotarev, "Certain Problems of the Modern Galois Theory."
V. V. Stepanov, "Quantitative Methods in the Theory of Differential Equations."
L. A. Lusternik and L. G. Schnirelmann (presented by the former), "Topological Methods as Applied to Problems of Extremals."
L. S. Pontrjagin, "Structure of Continuous Groups."
M. A. Lavrentiev, "Geometrical Questions in the Theory of Functions of Complex Variables."
N. M. Gunther, "Stieltjes Integrals in Mathematical Physics and in the Theory of Integral Equations."
I. M. Muntz, "Functional Methods in Boundary Problems."
S. Lefschetz, "Algebraic Geometry: Its Methods, Problems and Tendencies."
A. N. Kolmogorov, "Certain New Tendencies in the Theory of Probabilities."
I. A. Kibell, "Mechanics of Compressible Fluids."

The general level of papers presented and lectures given was of the highest. The formal lectures were attended by hundreds of auditors, even though several were usually given simultaneously, owing to shortage of time. One day was devoted to a discussion of

the work of the mathematical institutes and to an examination of the prospective development of mathematics in the Soviet Union. In this field of endeavor as in others there may be observed in the U.S.S.R. a strong tendency towards a planned and guided action.

The social features were not neglected, and there were interesting excursions to the former palatial country residences of the Czars and to the Islands. There were also all possible facilities for personal contacts and exchanges of views between the delegates in the social rooms of the Academy, of the Club des Savants, or during walks through Leningrad, which is most attractive in late June, the season of the famous White Nights.

The very high distinction reached by Soviet mathematics was fully reflected in the congress. The development of mathematics in the U.S.S.R., as in the United States, has largely been a matter of the last two generations. The majority of the delegates were young, many of them in the twenties. The common tone of optimism was also striking. While savants in the Union do not live as comfortably as their colleagues in the West, nevertheless they are very highly esteemed and treated accordingly. There are several mathematical institutes whose chief purpose seems to be to support a certain number of part or whole-time research professors, thus largely freeing the more capable men from routine teaching duties. Owing to the transfer of the Academy of Sciences to Moscow which has just taken place, there are now in the capital two first-rate mathematical research institutes—the Steklov Institute of the Academy, directed by Vinogradov, and the Institute of the University, directed by Kolmogorov. Moscow is thus more than ever one of the world's greatest mathematical centers. However, the encouragement given by the Soviet government to the cultural development of national groups is providing a healthy counter-balancing influence to excessive scientific centralization. We may therefore confidently look forward to the development of new scientific centers in entirely new localities and to the further growth of the older groups.

S. LEFSCHETZ

PRINCETON, N. J.

THE FIFTH CONGRESS OF THE INTERNATIONAL FEDERATION OF SURVEYORS

THE fifth congress of the International Federation of Surveyors was held in London, England, from July 18 to 21. There were present 346 delegates from 21 countries, the United States being represented by Colonel James Gordon Steese and the writer.

This brief report is prepared with the thought that some American engineers may be interested in the proceedings of this conference. It is necessary, however, to confine these remarks to the discussion at the meetings of the committee on improvements in instruments and methods in surveying, one of the five technical committees into which the entire congress was divided.

Papers were presented at the meetings on many subjects concerning instruments and methods. The open discussions, however, were confined to two topics which were considered of the most outstanding importance, namely: (1) The polar coordinate method for locating details in cadastral surveying, with special attention to the methods for measuring distances; (2) The use of aerial photogrammetry in cadastral surveying.

The committee recommended the use of the polar coordinate method for locating details in cadastral surveying, in preference to the rectangular coordinate or offset method. This is doubtless entirely in agreement with present practise in this country, for surely with the adoption of more modern methods of cadastral surveying American engineers are using the polar coordinate method very extensively. Both its advantages in most cases and its occasional limitations are familiar to all American surveyors.

However, the discussions of the methods for measuring distances are noteworthy. It is rather astounding to an American surveyor to find that in continental Europe the use of tapes for measuring distances in cadastral surveys is virtually superseded by the double-image tacheometer. Delegates at the congress agreed that the improved double-image tacheometers now manufactured in Europe were capable of measuring distances up to 140 meters with an accuracy of one part in 5,000, the modern tacheometers even being equipped with ingenious devices for reading directly horizontal instead of inclined distances. The committee recommended the extensive use of this instrument in cadastral surveys. Inasmuch as the method is at present seldom used in the country, this recommendation indeed deserves the attention of American surveyors.

Although it is understood that aerial photogrammetry is entirely inadequate under some circumstances in cadastral surveying, the discussion by the committee indicated their complete accord regarding the adaptability of the method in many cases. They recommended the method for use in cadastral surveying extensively but not exclusively. On account of the skepticism still existing among American surveyors regarding the resources of aerial photogrammetry, there is considerable significance in this recommendation, for it must be remembered that cadastral surveying is rather a severe test for the precision of the method and that this recommendation is made by a committee consisting largely of European engi-