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.

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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-

neers who are familiar with the use of the stereoscopic plotting instruments for photographic mapping.

These, then, are briefly the conclusions reached by the congress of the International Federation of Surveyors regarding what were considered as the two most outstanding topics in the field of improvements in the instruments and methods of surveying.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

BUTYL ALCOHOL AND CYTOLOGICAL TECHNIQUE

SEVERAL years ago the writer[1] described the advantages of *n*-butyl alcohol in dehydration and clearing specimens for paraffin embedding. Hemenway,[2] Earl,[3] LaCour,[4] Waterman[5] and Stiles[6] among others have extended and modified the technique so that now *n*-butyl alcohol is used in preparing many different types of material for embedding, and most cytological laboratories have a supply on hand. The purpose of this note is to call attention to some minor uses that can be made of this reagent.

A fluid composed of two parts of ethyl alcohol and one of butyl can dissolve both water and xylene and keep them in solution at the same time. Thus a mixture of

water	1 part
xylene	1 "
n-butyl alcohol	1 "
ethyl alcohol	2 " s

forms a single clear liquid. This solution is useful for cleaning slides as it will soften and remove both water-soluble substances (glycerine, glucose, etc.) and those which are fat soluble (immersion oil, balsam, etc.). Dilute ammonium hydroxide can be substituted for the water and carbon-tetrachloride for the xylene. This latter combination forms a very potent cleanser.

Another and perhaps more useful application of *n*-butyl alcohol to the cytological technique occurs in the hydration and dehydration of cut sections. The usual procedure is to place the slides containing the paraffin ribbons into a Coplin jar filled with xylene. When the paraffin is dissolved, the slides are transferred to absolute ethyl alcohol and then through several successive dilutions of alcohol to water. When the sections are stained they are passed back through the series of Coplin jars and mounted in balsam. Unfortunately, some xylene adheres to the slides and is carried on them into the absolute alcohol, where it soon appears as a milky precipitate as the alcohol absorbs moisture from the air. Likewise some alcohol and water are carried into the xylene, which also becomes clouded. In the moist atmosphere of seaside laboratories it is particularly difficult to prevent water from contaminating the absolute alcohol and the xylene. A few drops of *n*-butyl alcohol, however, added to these clouded fluids will clear them immediately, as the butyl alcohol will take both water and xylene back into solution. If the original series is made up as follows, no precipitate should occur.

(1) xylene 100 per cent.
(2) xylene 95 per cent., *n*-butyl alcohol 5 per cent.
(3) absolute ethyl alcohol 90 per cent., *n*-butyl alcohol 10 per cent.
(4) absolute ethyl alcohol 100 per cent., etc.

The writer has often passed more than a hundred slides through a single series of Coplin jars without renewing any of the solutions or obtaining any precipitate.

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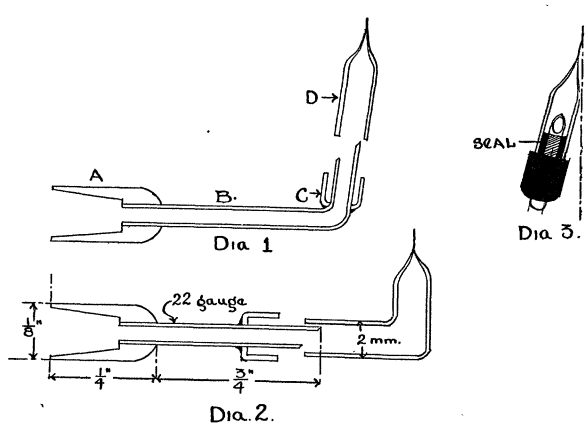
[1] SCIENCE, 71: 103–104, 1930.
[2] SCIENCE, 72: 251–252, 1930.
[3] SCIENCE, 72: 562, 1930.
[4] *Jour. Roy. Mic. Soc.*, 51: 119–126, 1931.
[5] *Stain Tech.*, 9: 23–31, 1934.
[6] *Stain Tech.*, 9: 97–100, 1934.

A MICROPIPETTE ADAPTER

MICROPIPETTES used for single cell isolation and dissection can be made from capillary glass tubing on a machine designed to pull them to a certain size.[1] Mechanically made pipettes require a special mounting or adapter before they can be used satisfactorily in a manipulator. Once mounted, however, they offer the advantages of being in a certain position and can be easily changed.

The adapters described herein are improvements over devices previously described.[1, 2] Diagram 1



[1] J. Arthur Reyniers, *Jour. Bacteriology*, 23: 2, February, 1932, pp. 183–192.
[2] *Ibid.*, 26: 3, September, 1933, pp. 251–287.