constituted as follows: F. Went, Utrecht, president; M. de Selys Longchamps, Brussels, secretary; A. Pictet, Geneva, treasurer; vice-presidents are the presidents of the sections and also the following: E. Terroine, Strasbourg; F. Botazzi, Naples; A. Lameere, Brussels.

The committees of the sections are constituted as follows: (a) Zoology—Odo de Buen, Madrid, president; M. Siedlicki, Cracow, vice-president; C. Verne, Paris, secretary. (b) Botany—B. Nemeč, Prague, president; K. Shibata, Tokyo, vice-president; J. Briquet, Geneva, secretary.

I conclude by expressing the wish that many countries which up till now have not joined the union will do so, because only then the union will become strong enough to undertake such work as will benefit biological sciences.

F. A. F. C. WENT

QUOTATIONS

INTELLECTUAL COOPERATION

THE movement towards what is known as intellectual cooperation, fostered by the League of Nations (writes our correspondent from Geneva), is steadily gaining ground. The Institute of Intellectual Cooperation, domiciled in Paris but a league offspring, is now subsidized by eleven nations. The committee which takes this sphere of the league's work under its control is presided over by Professor Gilbert Murray, in succession to the late Professor Lorentz, and has among its members some eminent European scientists, including more than one professor of medicine. Professor Gilbert Murray reported to the present assembly that interchanges of professors and students between universities in different countries had been encouraged, and that there was now proceeding an interchange of secondary-school teachers. These interchanges are of the same character as those of public-health officers, undertaken by the Health Organization, and appear to be equally fruitful. It is noteworthy that the American Council of Education has placed a sum of money at the disposal of the committee for the purpose of an inquiry into university relations in Europe and the facilities available there for American students. The question of traveling or exchange scholarships has been remitted to a committee of experts with a view—the reference is rather vague—"to reaching conclusions that will be applicable not only to scientific laboratories, but also to research institutes, in the field of humanities and social science." A draft convention has also been formulated with the object of assuring for scientists the financial benefits which are justified by the profitable use of their discoveries—in other words, to prevent the unauthorized and unacknowledged use in one country of the work of a scientist of another. The British government, however, has found some technical fault in the convention, which as drawn up, it considers, would interfere with industrial activity, and the matter has not at present gone further than the sphere of proposal. An attempt is being made to bring libraries and universities of all countries into a scheme of cooperation whereby scientific or bibliographical information may be made mutually available. Another enterprise aims at the removal of undue hindrances, in the shape of customs barriers and postal tariffs, to the international distribution of books. It is intended to urge that scientific works, particularly works intended for libraries and scientific institutions, should be exempt from customs duties. The question of scientific works published in the less known languages has also received attention; it appears that in the countries where such works have been published there is already a sufficient recognition of the need of securing translations in one or other of the more widely diffused languages. The language difficulty, as any one who has attended an international congress will agree, is the principal hindrance to full international cooperation and understanding. In spite of the skilled army of interpreters at Geneva, difference of language is a constant impediment, leading every day to embarrassment and frustration, and sometimes to even more disagreeable results. If the Committee on Intellectual Cooperation would urge a wider acquaintance with the French language amongst English-speaking peoples, and with the English language among the Latin peoples, a great deal of good might be done.—*The British Medical Journal.*

SPECIAL ARTICLES

ALTERATIONS OF TISSUE CELLS IN THE BLOOD STREAM

CERTAIN aspects of the origin and development of blood cells are difficult to study because of the different fixation and staining qualities of the cells in the bone marrow and those in the blood stream. Fixation of the cells for sectioning changes their morphology so that they are no longer comparable to the pictures obtained when blood films are made. Some of the differences can be eliminated if bone marrow is shaken with blood serum or pleural or ascitic fluid. The cells separate easily, and cover-glass films can be made similar to those of blood. This method was found to be feasible for the study of tumor tissue, and was especially applicable for the study of mitotic figures. The phenomenon was first noted while studies of tissue

metabolism were being made in a microspirometer.[1] The cells can be studied in the moist state directly or with vital stains, or can be dried on cover-glasses and stained with the usual methods. A remarkable change takes place in the staining qualities of the marrow cells when they are exposed to blood serum, either by shaking or by treating bone marrow smears or sections with blood serum. The cells take the stain intensely instead of the paler tint usually noted in bone marrow films, especially when stains such as Wright's stain are used. *Exposure to serum causes the cells to stain similar to those of the blood stream,* so that it is much easier to identify tissue cells in their genetic relation to those of the peripheral circulation. The change in the staining qualities emphasizes the marked difference in the chemical and physical environment of the cells in the tissues and those in the blood. It suggests something of the altered physiology of the cells in the bone marrow and their change in function when they enter the blood stream. It makes it appear more improbable that cells, which should mature in the tissues, ever continue their normal development when forced prematurely, under abnormal conditions, into the circulation. Dissociated cells of other organs, as the spleen, as well as tumor tissue, show changes after treatment with blood serum which enable their identification when they appear in the peripheral circulation. The mechanism of the change in staining qualities does not appear to be one of change in hydrogen-ion concentration only, although this may be one factor.

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ABERRANT HETEROTHALLISM IN A HOMOTHALLIC COPRINUS[1]

IN connection with cytological studies in the Agaricaceae, the writer has made single-spore isolations to determine the sex reactions of the species studied. Previous workers have shown that certain Hymenomycetes are regularly homothallic, whereas others are regularly heterothallic. Their results have been verified in general, but in some cases interesting exceptions have been encountered.

A form of *Coprinus ephemerus* Fries, in which the basidia are two-spored, was isolated. This form seemed at first to be homothallic, since mycelium from single spores in most cases developed clamp connections, the cells of the mycelium were binucleate, and fruit bodies were produced. Some exceptions to this behavior were observed, and by making a large number of isolations, a few viable mycelia were isolated, in which the cells became permanently uninucleate, clamp connections were not formed and no fruiting occurred. These exceptional mycelia had all the characteristics of the primary condition. When they were paired in all possible combinations, mating occurred between certain pairs, giving rise to a mycelium with binucleate cells and clamp connections.

TABLE I

SAMPLE OF THE DATA OBTAINED IN THE PAIRING OF PRIMARY MYCELIA OF THE TWO-SPORED FORM OF *Coprinus ephemerus* FR.

	7	6	5	4	3	2
1	−	−	−	−	−	+
2	+	+	−	+	+	
3	−	−	−	−		
4	−	−	−			
5	−	−				
6	−					

Table I is a fair sample of the results obtained. It demonstrates the inadequacy of the hypothesis that one pair of Mendelian factors (Aa) determine sex in this case. If we arbitrarily assign factor (A) to mycelium No. 1, mycelium No. 2 with which No. 1 crosses, must be given the factor (a). Then it follows that mycelia 3, 4, 6 and 7 also have the factor (A). But No. 5 does not conform to this scheme because it neither crosses with (A) or (a). Obviously, there is no strict segregation into two functional sex classes and it seems probable that a functional sexual mycelium is determined by more than one pair of factors. It is definitely established, however, that in a normally homothallic form there are occasional haploid, primary mycelia, which cross in certain pairings, giving rise to apparently normal diploid, secondary mycelia.

The fruit body is also diploid, karyogamy and meiosis taking place in the basidium. Each basidium contains four nuclei just prior to spore formation. Two spores develop on the basidium and the writer has found that a spore may receive either one or two nuclei. It may be presumed that a spore which receives two nuclei of the proper kind carries the factors necessary to produce a secondary fruiting mycelium and is therefore homothallic. On the contrary, a spore which receives one nucleus does not have a complete set of sex factors, and its haploid mycelium must be crossed with another mycelium which carries the necessary allellomorphs in order to bring about the secondary condition. The cytological data are in harmony with the available cultural data. A full account of the writer's work will be published in the near future.

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[1] G. A. Daland and Raphael Isaacs, "Cell Respiration Studies," *Jour. Exp. Med.*, July, 1927, *46*, 53.

[1] Papers from the Department of Botany of the University of Michigan, No. 300.