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Monthly Review of the
World Intellectual Property Organization (WIPO)

Contents

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World Intellectual Property Organisation

WIPO Convention

Accession

HONDURAS

The Government of Honduras deposited, on August 15, 1983, its instrument of accession to the Convention Establishing the World Intellectual Property Organization, signed at Stockholm on July 14, 1967.

Honduras will belong to Class C for the purpose of establishing its contribution towards the budget of the WIPO Conference.

The said Convention will enter into force, with respect to Honduras, on November 15, 1983.

WIPO Notification No. 124, of August 16, 1983.

International Unions

Hague Agreement

Amendments to the Agreement

Tbe following amendments to the Complementary Act of Stockholm of July 14, 1967, to the Hague Agreement Concerning the International Deposit of Industrial Designs of November 6, 1925, entered into force on November 3, 1980:

- in Article 2 (2) *(a)* (v), "triennial" is replaced by "biennial"; and
- in Article 2 (4) *(a)*, "third" is replaced by "second."

Those amendments affect the periodicity of the program and budget as well as of the sessions of the Assembly of the Hague Union.

The said amendments were unanimously adopted by the Assembly of the Hague Union on October 2, 1979. Their entry into force was brought about upon the receipt by the Director General of WIPO of notifications of acceptance of those amendments by the required number of the States members of the Assembly of the Hague Union at the time the said Assembly adopted those amendments. The said notifications of acceptance were received, in chronological order, from the following seven States, the date of receipt being indicated after each State: Liechtenstein (November 16, 1979); Germany (Federal Republic of) (December 11, 1979); Monaco (January 23, 1980); France (January 31, 1980); Suriname (March 3, 1980); Switzerland (July 3, 1980); Luxembourg (October 3, 1980).

The said amendments bind all the States members of the said Assembly at the time those amendments entered into force and will bind all other States that became or become members of that Assembly subsequent to their date of entry into force.

The Hague Notification No. 19, of July 11, 1983.

Nice Agreement

I. Amendments to the Agreement

The following amendments to the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks of June 15, 1957, as revised at Stockholm on July 14, 1967, and at Geneva on May 13, 1977, entered into force on September 6, 1982:

- in Article 5(2)*(a)*(iv), "triennial" is replaced by "biennial"; and
- in Article 5(4)*(a)*, "third" is replaced by "second."

Those amendments affect the periodicity of the program and budget as well as of the sessions of the Assembly of the Nice Union.

The said amendments were unanimously adopted by the Assembly of the Nice Union on October 2, 1979. Their entry into force was brought about upon the receipt by the Director General of WIPO of notifications of acceptance of those amendments by the required number of the States members of the Assembly of the Nice Union at the time the said Assembly adopted those amendments. The said notifications of acceptance were received, in chronological order, from the following 21 States, the date of receipt being indicated after each State: Liechtenstein (November 16, 1979); Germany (Federal Republic of) (December 11, 1979); Norway (December 14, 1979); Denmark (December 24, 1979); Ireland (January 4, 1980); Sweden (January 9, 1980); Spain (January 17, 1980); Monaco (January 23, 1980); France (January 31, 1980); Italy (February 26, 1980); Czechoslovakia (April 15, 1980); United States of America (June 2, 1980); Switzerland (July 3, 1980); Luxembourg (October 3, 1980); United Kingdom (November 4, 1980); Hungary (February 19, 1981); Finland (October 23, 1981); Soviet Union (October 30, 1981); Australia (November 13, 1981); Israel (November 15, 1981); German Democratic Republic (August 6, 1982).

The said amendments bind all the States members of the said Assembly at the time those amendments entered into force and will bind all other States that became or become members of that Assembly subsequent to their date of entry into force.

Nice Notification No. 58, of July 11, 1983.

II. Ratification of the Geneva Act (1977)

LUXEMBOURG

The Government of Luxembourg deposited, on September 16, 1983, its instrument of ratification of the Geneva Act of May 13, 1977, of the Nice Agreement of June 15, 1957, as revised at Stockholm on July 14, 1967.

The Geneva Act (1977) of the said Agreement will enter into force, with respect to Luxembourg, on December 21, 1983.

Nice Notification No. 59, of September 21, 1983.

Locarno Agreement

Amendments to the Agreement

The following amendments to the Locarno Agreement Establishing an International Classification for Industrial Designs, signed at Locarno on October 8, 1968, entered into force on November 23, 1981:

- in Article 5(2)*(a)*(iv), "triennial" is replaced by "biennial"; and
- in Article 5(4)*(a)*, "third" is replaced by "second."

Those amendments affect the periodicity of the program and budget as well as of the sessions of the Assembly of the Locarno Union.

The said amendments were unanimously adopted by the Assembly of the Locarno Union on October 2, 1979. Their entry into force was brought about upon the receipt by the Director General of WIPO of notifications of acceptance of those amendments by the required number of the States members of the Assembly of the Locarno Union at the time the said Assembly adopted those amendments. The said notifications of acceptance were received, in chronological order, from the following twelve States, the date of receipt being indicated after each State: Norway (December 14, 1979); Denmark (December 24, 1979); Ireland (January 4, 1980); Sweden (January 9, 1980); Spain (January 17, 1980); France (January 31, 1980); Italy (February 26, 1980); Czechoslovakia (April 15, 1980); United States of America (June 2, 1980); Switzerland (July 3, 1980); Hungary (February 19, 1981); Finland (October 23, 1981).

The said amendments bind all the States members of the said Assembly at the time those amendments entered into force and will bind all other States that became or become members of that Assembly subsequent to their date of entry into force.

Locarno Notification No. 20, of July 11, 1983.

Strasbourg Agreement

Amendments to the Agreement

The following amendments to the Strasbourg Agreement Concerning the International Patent Classifica-

tion of March 24, 1971, entered into force on February 25, 1982:

- in Article 7(2)*(a)*(iv), "triennial" is replaced by "triennial"; and
- in Article 7(4)*(a)*, "third" is replaced by "second."

Those amendments affect the periodicity of the program and budget as well as of the sessions of the Assembly of the IPC Union.

The said amendments were unanimously adopted by the IPC Union on October 2, 1979. Their entry into force was brought about upon the receipt by the Director General of WIPO of notifications of acceptance of those amendments by the required number of the States members of the Assembly of the IPC Union at the time the said Assembly adopted those amendments. The said notifications of acceptance were received, in chronological order, from the following 21 States, the date of receipt being indicated after each State: Germany (Federal Republic of) (December 11, 1979); Norway (December 14, 1979); Denmark (December 24, 1979); Ireland (January 4, 1980); Sweden (January 9, 1980); Spain (January 17, 1980); Monaco (January 23, 1980); France (January 31, 1980); Brazil (February 8, 1980); Italy (February 26, 1980); Suriname (March 3, 1980); Czechoslovakia (April 15, 1980); United States of America (June 2, 1980); Switzerland (July 3, 1980); Luxembourg (October 3, 1980); United Kingdom (November 4, 1980); Portugal (December 15, 1980); Soviet Union (October 30, 1981); Australia (November 13, 1981); Israel (November 25, 1981); Egypt (January 25, 1982).

The said amendments bind all the States members of the said Assembly at the time those amendments entered into force and will bind all other States that became or become members of that Assembly subsequent to their date of entry into force.

Strasbourg Notification No. 33, July 11, 1983.

Budapest Treaty (Microorganisms)

Accession

BELGIUM

The Government of Belgium deposited, on September 15, 1983, its instrument of accession to the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, done at Budapest on April 28, 1977.

The said Treaty will enter into force, with respect to Belgium, on December 15, 1983.

Budapest Notification No. 33, of September 19, 1983.

Nairobi Treaty (Olympic Treaty)

I. Ratification

QATAR

The Government of Qatar deposited, on June 23, 1983, its instrument of ratification of the Nairobi Treaty on the Protection of the Olympic Symbol, adopted at Nairobi on September 26, 1981.

The said Treaty entered into force, with respect to Qatar, on July 23, 1983.

Nairobi Notification No. 12, of August 23, 1983.

II. Signatory States

During the period during which it was open for signature, the following 37 States had signed the Nairobi Treaty, adopted at Nairobi on September 26, 1981:

Argentina, Austria, Benin, Brazil, Chile, Colombia, Congo, Czechoslovakia, Democratic People's Republic of Korea, Ghana, Greece, Hungary, India, Indonesia, Israel, Italy, Ivory Coast, Kenya, Madagascar, Mexico, Morocco, New Zealand, Peru, Poland, Portugal, Qatar, Romania, Senegal, Soviet Union, Spain, Sri Lanka, Switzerland, Togo, Trinidad and Tobago, Tunisia, Uruguay, Zambia.

As of the date of the present notification, the following States have already deposited, on the dates hereinafter indicated, either an instrument of ratification (R) or accession (A) and the said Nairobi Treaty entered into force, in respect of the said States, on the dates hereinafter indicated:

State	*Date of Deposit of Instrument*	*Date of Entry into Force*
Kenya (R)	November 18, 1981	September 25, 1982
Ethiopia (A)	February 17, 1982	September 25, 1982
Equatorial Guinea (A)	August 25, 1982	September 25, 1982
Egypt (A)	September 1, 1982	October 1, 1982
Guatemala (A)	January 21, 1983	February 21, 1983
Congo (R)	February 8, 1983	March 8, 1983
Tunisia (R)	April 21, 1983	May 21, 1983
Qatar (R)	June 23, 1983	July 23, 1983
Greece (R)	July 29, 1983	August 29, 1983

States which have signed the Treaty and which have not yet deposited their instruments of ratification, acceptance or approval must, in order to become party to the Treaty, deposit such instruments.

States which have not signed the Treaty must, in order to become party to the Treaty, deposit their instruments of accession; any such State must be a member of WIPO or any of the other specialized agencies brought into a relationship with the United Nations, the Paris Union for the Protection of Industrial Property or the United Nations.

Instruments of ratification, acceptance, approval or accession must be deposited with the Director General of WIPO.

Nairobi Notification No. 13, of August 29, 1983.

III. Ratification

INDIA

The Government of India deposited, on September 19, 1983, its instrument of ratification of the Nairobi Treaty.

The said Treaty entered into force, with respect to India, on October 19, 1983.

Nairobi Notification No. 14, of September 22, 1983.

IV. Accession

UGANDA

The Government of Uganda deposited, on September 21, 1983, its instrument of accession to the Nairobi Treaty.

The said Treaty entered into force, with respect to Uganda, on October 21, 1983.

Nairobi Notification No. 15, of September 22, 1983.

Vienna Agreement (Classification of Figurative Elements of Marks)

Ratification

LUXEMBOURG

The Government of Luxembourg deposited, on September 16, 1983, its instruments of ratification of the Vienna Agreement Establishing an International Classification of the Figurative Elements of Marks, done at Vienna on June 12, 1973.

A separate notification will be made of the date of the entry into force of the said Agreement when the required number of ratifications or accessions is reached.

Vienna (Classification) Notification No. 5, of September 21, 1983.

Plant Varieties

International Convention for the Protection of New Varieties of Plants

Ratification of the 1978 Act

UNITED KINGDOM

The Government of the United Kingdom deposited, on August 24, 1983, its instrument of ratification of the Act of October 23, 1978, of the International Convention for the Protection of New Varieties of Plants of December 2, 1961, as revised at Geneva on November 10, 1972.

The said Act entered into force, with respect to the United Kingdom, on September 24, 1983.

UPOV Notification No. 29, of August 29, 1983.

Activities of Other Organizations

International Federation of Industrial Property Attorneys

Resolution on the Right of Priority

The Executive Committee of the International Federation of Industrial Property Attorneys (FICPI) met in Ottawa from September 27 to October 2, 1982. During that meeting, it adopted the following resolution concerning the right of priority under the Paris Convention.

Resolution

FICPI,

recognizing that there are differences between countries members of the Paris Union concerning the treatment of cases where failure to file by the expiry of the priority term can result in a loss of rights,

and that distinctions are drawn in some national laws and practices between failure to observe a term set for taking a certain action and failure to observe the priority term,

urges member States of the Paris Union to provide reasonable remedies to applicants to enable a priority claim to be allowed in cases where an applicant's intention to file within the priority term was frustrated, and thereafter an application is made to the relevant industrial property office, at least if such application is submitted shortly after the expiry of the priority term.

WIPO Meetings

Paris Union

Committee of Experts on the Legal Protection of Computer Software

Second Session
(Geneva, June 13 to 17, 1983)

NOTE*

The Committee of Experts on the Legal Protection of Computer Software (hereinafter referred to as "the Committee of Experts" held its second session[1] in Geneva from June 13 to 17, 1983.

Thirty States members of WIPO, of the International (Paris) Union for the Protection of Industrial Property or of the International (Berne) Union for the Protection of Literary and Artistic Works participated in the session. One State participated as observer. Five intergovernmental organizations, 16 international non-governmental organizations and four national associations participated in the meeting as observers. The list of participants follows this Note.

The Committee of Experts dealt with three questions. The first question was whether a new international multilateral treaty should be concluded under the terms of which the governments of the Contracting States would undertake to take measures against the unauthorized commercial use of computer software originating in the Contracting States. The second question was whether the protection of integrated circuits could also be covered by such a treaty. The third question was whether a mechanism for the international deposit of computer software should be established. Such deposit would not be a condition of the legal protection of computer software but would facilitate the proof of ownership in the deposited software.

* Prepared by the International Bureau.

[1] For the Note on the first session, see *Industrial Property*, 1980, p. 30.

After a thorough discussion of all these questions, the Committee of Experts arrived at the following conclusions:

"I. *Protection of Computer Software*

"1. The WIPO Committee of Experts on the Legal Protection of Computer Software, meeting in Geneva from June 13 to 17, 1983, noted with great appreciation the work undertaken hy WIPO in many ways during the last decade in order to secure efficient protection of computer software. The Committee also noted with great appreciation the elaboration by the International Bureau of a draft Treaty for the protection of computer software. It had, on the hasis of that draft and other working documents, including the WIPO Model Provisions on the Protection of Computer Software (1978), a detailed discussion on the suhstance matter of the protection desirable in respect of computer software. As regards the form for such protection, various suggestions were made for solutions other than the proposed draft Treaty, such as a recommendation to States on the principles for the international protection in this field.

"2. The Committee expresses the unanimous view that, whatever the form would be, there should he effective international protection of computer software.

"3. The Committee took note of the information given at the meeting on the increasing trend at the national level in a certain number of countries of granting protection under copyright law to computer software. It noted that this situation could have—thanks to the principle of national treatment—the consequence that the need for international protection may, between such countries, be satisfied to a considerable extent by means of the international copyright conventions. The Committee also noted that WIPO, jointly with Unesco, suggested undertaking a study and convening a committee of governmental experts on the protection available for computer software under existing copyright laws and treaties.

"4. In view of the foregoing considerations and of the complexity of the prohlem, the Committee considered it premature to take, for the time being, a stand on the question of the best form for the international protection of computer software and recommended that the consideration of the conclusion of a special treaty as presented to it should not he pursued for the time heing.

"5. Furthermore, the Committee recommends that the results of its present session, together with supplementary observations to be invited from governments and interested international organizations (for example, as to whether any mechanism for the protection of ideas or concepts on which software is hased, such as methods, processes, or systems of operation, would be desirahle), as well as a compilation of relevant court decisions, be hrought to the attention of the governments, interested organizations and the said joint WIPO/Unesco Committee of Governmental Experts.

"6. The Committee also recommended that it should, at a later stage, he convened to consider once more the issue of the hest form of international protection in connection with or in the light of the work conducted within the framework of the joint WIPO/Unesco study.

"7. Finally, the Committee recommended convening a working group for examining certain technical issues, in particular the definition of computer software.

"II. *Protection of Integrated Circuits*

"8. The WIPO Committee of Experts on the Legal Protection of Computer Software discussed the increasingly important question of the protection of integrated circuits.

"9. The Committee recommended that WIPO should prepare as a matter of priority, with the help of consultants, a working paper on the protection of integrated circuits. It expressed the wish that this working paper be submitted to the governments and interested organizations in sufficient time before such paper is taken up for examination in the forum to be designated for that purpose in the framework of the Paris Union.

"III. *International Deposit of Computer Software*

"10. The WIPO Committee of Experts on the Legal Protection of Computer Software discussed the question of an international deposit of computer software.

"11. The Committee is of the opinion that the study of establishing such a deposit, at least at an international level, should not be pursued at this time."

LIST OF PARTICIPANTS*

I. States

Australia: F.J. Smith; R.A.I. Bell. **Austria**: R. Dittrich; O. Rafeiner. **Belgium**: G.P.V. Vandenberghe. **Benin**: O.M. Winsalas Dare. **Brazil**: R.N. Botelho de Noronha. **Canada**: A.D. Bryce. **China**: Kung Hsi. **Congo**: D. Ganga-Bidie. **Denmark**: J. Norup-Nielsen; M. Koktvedgaard. **Egypt**: M. Daghash. **Finland**: J. Liedes; S. Lathtinen. **France**: A. Kerever; A. Bourdale-Dufau; J. Myard; R. Richter; B. Vidaud; A. Grissonnanche. **Germany (Federal Republic of)**: M. Möller. **Hungary**: G. Pálos; L. Mohácsy. **India**: L. Puri; N. Seth. **Italy**: G.L. Milesi Ferretti; R. Boros; M. Fabiani; C. Casuccio. **Japan**: S. Ono; K. Sakamoto; Y. Oyama; Y. Tsunoda; F. Kato; S. Ozawa. **Mexico**: V.C.

* A list containing the titles and functions of the participants may be obtained from the International Bureau.

Garcia-Moreno; M. Arce. **Morocco**: M. Najim; M. Er-Rahhaly. **Netherlands**: R. Furstner; J.E.M. Galama; E.C. Nooteboom; J. Meijer van der Aa. **Norway**: J. Bing. **Republic of Korea**: J.-V. Chae. **Singapore**: R. Magnus; P.-Y. Thong. **Spain**: F.J. Alegria Martinez de Pinillos; M. Heredero. **Sweden**: H. Olsson; J.-E. Bodin. **Switzerland**: K. Govoni; Ch. Hilti. **Trinidad and Tobago**: H. Robertson. **Tnnisia**: R. Tlili; R. Attia. **Turkey**: E. Apakan. **United Kingdom**: P. Ferdinando. **United States of America**: M.S. Keplinger; H.D. Hoinkes.

II. Intergovernmental Organizations

Commission of the European Communities (CEC): B. Posner; E. Peeters; H. Bank; J. Girerd. **European Pateot Organisation (EPO)**: G. Korsakoff; P.K.J. van den Berg; G.D. Kolle. **Intergovernmental Bureau for Informatics (IBI)**: T. Ennison. **United Nations Educational, Scientific and Cultural Organization (UNESCO)**: E. Guerassimov. **World Health Organization (WHO)**: R. Gallagher.

III. International Non-Governmental Organizations

Chartered Institute of Patent Agents (CIPA): J.U. Neukom. **Committee of National Institutes of Pateot Agents (CNIPA)**: J. Betten. **European Computer Manufacturers' Association (ECMA)**: M. Colombe. **European Computing Services Association (ECSA)**: D.R.C. Robertson. **European Federatioo of Ageots of Industry in Industrial Property (FEMIPI)**: G.P. Hommery; B. Villinger. **International Association for the Protection of Industrial Property (AIPPI)**: T. Mollet-Vieville; T. Doi. **International Confederation of Societies of Anthors and Composers (CISAC)**: D. de Freitas. **International Federation of Industrial Property Attorneys (FICPI)**: H. Bardehle; T.D. Jennings. **International Federation of Information Processing (IFIP)**: R.J. Hart. **International Federation of Phonogram and Videogram Producers (IFPI)**: G. Davies; E. Thompson; B. von Silva Tarouca; T. Ambrosini. **International League Against Unfair Competition (LICCD)**: J. Evrard; M. Muhlstein. **International Literary and Artistic Association (ALAI)**: D. de Freitas. **International Publishers Associatioo (IPA)**: J.A. Koutchoumow. **Licensing Executives Society (International) (LES)**: C.G. Wickham. **Uoion of European Practitiooers in Industrial Property (UEPIP)**: J. Lecca. **Union of Industries of the European Commnnity (UNICE)**: M. Kindermann.

IV. Other Organizations

Association of Data Processing Service Organizations (ADAPSO): R.J. Palenski. **Computer and Business Equipmeot Manufacturers' Association**: H.M. Brownrout; O.R. Smoot. **Computer Law Association**: S.H. Nycum Bosworth. **Information Industry Association**: R.S. Willard.

V. Officers

Chairman: H. Olsson (Sweden). *Vice-Chairmen:* Gy. Pálos (Hungary); M. Najim (Morocco). *Secretary:* F. Balleys (WIPO).

VI. International Bureau of WIPO

A. Bogsch *(Director General)*; K. Pfanner *(Deputy Director General)*; L. Baeumer *(Director, Industrial Property Division)*; F. Balleys *(Head, Industrial Property Law Section, Industrial Property Division)*; A. Ilardi *(Senior Legal Officer, Industrial Property Law Section)*.

WIPO
Permanent Committee on Patent Information (PCPI)

I. Working Group on Planning

Eleventh Session
(Geneva, May 26 to June 3, 1983)

NOTE*

The Working Group on Planning (hereinafter referred to as "the Planning Group") of the WIPO Permanent Committee on Patent Information (hereinafter referred to as "the PCPI") held its eleventh session in Geneva from May 26 to June 3, 1983. Fourteen members of the Planning Group were represented at the session. The list of participants follows this Notc.

The Planning Group approved its report on the effectivcncss of the PCPI program for thc biennium 1982/83 and agreed that it should be submitted to the PCPI.

The Planning Group reviewed the long-term program of the PCPI as adopted by the PCPI at its session in 1982. The long-term program of the PCPI gives the objectives, present status and current work of each of 14 broad headings which reflect the objectives and tasks embodied in the Organizational Rules of the PCPI. Those broad headings relate to:

(a) matters concerning patent information sources, i.e.:
- guidelines and standards;
- use and revision of the International Patent Classification (IPC);
- indexing, classifying and coding patent documents according to their technical content;
- industrial property statistics;
- search files and their organization;
- cxchange of patcnt documents;
- organization of patent documentation and information ccnters;
- training;

(b) matters concerning dissemination of patent information, i.e.:
- bibliographic referral services;
- sources of patent information;
- users of patent information and their needs;
- users' guides to patent information;
- monitoring technical developments relevant to the needs of patent information;

* Prepared by the International Bureau.

— promotion of the value of patent information.

Under each broad heading of this long-term program, possible future work areas are given. The Planning Group evaluated the said future work areas on the basis of comments received and agreed on a list of nine items for which detailed proposals should be invited in 1984, namely:

— standardization of official gazettes and other industrial property "announcement" journals;
— elaboration of guidelines for the publication of indexes issued yearly/half-yearly/quarterly by industrial property offices;
— identification of areas of the IPC that are inefficient for searching;
— improvement of working procedures and elaboration of instruction materials, aiming at the unification and streamlining of the publication process of successive editions of the IPC;
— establishment of an internationally agreed program for the elaboration of hybrid systems (that is, systems which combine classification techniques with indexing techniques);
— studying means of reducing the bulkiness of search files, e.g. by excluding patent families and multiple publications, by revising arrangements as to cut-off dates, by the use of microfilms, etc.;
— providing better access outside Japan to Japanese patent documents;
— studying the use of patent information as an indicator for the trend of tecbnologies;
— studying further the developments of hybrid systems including development of automatic search systems based on IPC symbols and textual information (e.g., keywords).

The Planning Group establisbed a draft PCPI program for the biennium 1984/85 consisting of 31 tasks, including six new tasks and 80 IPC revision proposals relating to 86 IPC subclasses. In elaborating that draft program, the Planning Group agreed that certain questions, concerning the PCPI and its relation to developing countries, and the PCPI and its broad objectives, should be drawn to the attention of the PCPI.

The Planning Group finally recommended that, for working on the tasks foreseen on the PCPI program for the next biennium, five Working Groups be established in 1984 as follows:

— a Working Group on Planning;
— a Working Group on Special Questions;
— a Working Group on General Information;
— a Working Group on Search Information;
— a Working Group on Patent Information for Developing Countries.

A schedule of sessions of the PCPI and its five Working Groups in the biennium 1984/85 was tentatively agreed upon.

LIST OF PARTICIPANTS*

I. Members

Australia: F.J. Smith. **Austria**: F. Sohs. **Brazil**: G.R. Coaracy. **Canada**: G.R. McLinton. **France**: A. de Pastors. **Germany (Federal Republic of)**: W. Weiss. **Japan**: T. Itagaki; S. Ono. **Soviet Union**: W.I. Kukolev; V.I. Blinnikov. **Spain**: J.A. Canido Jove; R. Vazquez de Parga. **Sweden**: L.G. Björklund; K. Bergström. **Switzerland**: E. Caussignac. **United Kingdom**: V.S. Dodd. **United States of America**: B. Huther; W.S. Lawson; T.F. Lomont.

II. Member Organization

European Patent Office (EPO): R. Baré; E. de Bundel.

III. Officers

Chairman: W.S. Lawson (United States of America). *Vice-Chairmen:* W.I. Kukolev (Soviet Union); E. Caussignac (Switzerland). *Secretary:* P. Higham (WIPO).

IV. International Bureau of WIPO

P. Claus *(Director, Classifications and Patent Information Division)*; P. Higham *(Head, Developing Countries Section, Classifications and Patent Information Division)*; R. Blumstengel *(Head, Patent Information Section, Classifications and Patent Information Division)*; A. Sagarminaga *(Senior Patent Classification Officer, IPC Section, Classifications and Patent Information Division)*.

* A list containing the titles and functions of the participants may be obtained from the International Bureau.

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II. Working Group on Special Questions

Third Session
(Geneva, May 26 to June 3, 1983)

NOTE*

The Working Group on Special Questions (hereinafter referred to as "tbe Working Group") of the WIPO Permanent Committee on Patent Information (hereinafter referred to as "the PCPI") held its third session in Geneva from May 26 to June 3, 1983. Thirteen members of the Working Group were represented at the session. The list of participants follows this Note.

The Working Group, in its discussions of *computerized searching aids*, noted the information collected by the International Bureau concerning the use and the extent of use of patent data bases and the results of a certain number of model searcbes conducted in the said data bases. The Working Group also noted that all Offices whicb bad reported use of patent data bases had

* Prepared by the International Bureau.

emphasized that the results of searches in those data bases were mere "aids," supplementary tools to alleviate the burden of the patent examiners when searching, and not means to replace in total the actual search procedures. The most important computerized searching aids identified were the on-line data bases offered by IFI Plenum Data Corporation (United States of America), Pergamon Infoline (United Kingdom), SDC/Derwent Search Service (United Kingdom) and Télésystèmes-Questel (France). The most common type of search conducted with the help of these searching aids was that in which symbols of the International Patent Classification (IPC) were searched in combination with keywords.

The Working Group discussed the revision of the *list of periodicals* established for the purposes of the PCT minimum documentation, [under PCT Rule 34.1*(b)*(iii)] it agreed to recommend that 16 periodicals on the said list—which now contains 171 periodicals—should be deleted, and identified 19 new periodicals as candidates for addition to the list. A majority of the members of the Working Group were in favor of a proposal to replace a further eleven periodicals by new periodicals, on the basis that the new periodicals cover the same areas of technology as those they would replace but have a higher content of articles useful for the purposes of patent examination.

The Working Group also discussed the more general question of the technical coverage given by the periodicals presently on the said list, since, on the basis of a preliminary analysis made by the International Bureau, a certain imbalance seemed to exist between technical subjects covered by published patent documents and technical subjects covered by items of non-patent literature selected for adding to search files. The Working Group also discussed whether, in view of the now widely available on-line computer data bases which provide access to most, if not all, of the items of non-patent literature published in the periodicals on the said list, a need still existed to define a minimum list of periodicals.

The Working Group completed its work of considering the *philosophy of the revision work* of the International Patent Classification during the third revision period.

LIST OF PARTICIPANTS*

I. Members

Austria: F. Sohs. **Brazil**: G.R. Coaracy. **Canada**: G.R. McLinton. **France**: A. de Pastors. **Germany (Federal Republic of)**: W. Weiss; K. Müllner. **Japan**: T. Itagaki; S. Ono. **Soviet Union**: W.I. Kukolev; V.I. Blinnikov. **Spain**: D.J. Canido Jove. **Sweden**: L.G. Björklund; K. Bergström. **Switzerland**: E. Caussignac. **United Kingdom**: V.S. Dodd. **United States of America**: B. Huther; W.S. Lawson; T.F. Lomont.

II. Member Organization

European Patent Office (EPO): A. Vandecasteele; R. Baré.

III. Officers

Chairman: W.S. Lawson (United States of America). *Vice-Chairmen:* W.I. Kukolev (Soviet Union); E. Caussignac (Switzerland). *Secretary:* P. Higham (WIPO).

IV. International Bureau of WIPO

P. Claus *(Director, Classifications and Patent Information Division)*; B. Hansson *(Head, IPC Section, Classifications and Patent Information Division)*; P. Higham *(Head, Developing Countries Section, Classifications and Patent Information Division)*; R. Blumstengel *(Head, Patent Information Section, Classifications and Patent Information Division)*.

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III. Working Group on Search Information

Tenth Session
(Geneva, June 6 to 16, 1983)

NOTE*

The PCPI Working Group on Search Information (hereinafter referred to as "the Working Group") held its tenth session in Geneva from June 6 to 16, 1983. Twelve member States and the European Patent Office (EPO) were represented at the session. The International Federation for Documentation (FID) was represented as observer. The list of participants follows this Note.

The following items were discussed:

IPC Revision Projects Carried Over from the 1982 Program. The Working Group discussed 42 revision projects and completed 40 of them. It rejected two of them and invited further action on one revision project.

IPC Revision Projects on the Program for 1983. The Working Group discussed 30 IPC revision projects of the IPC revision program for 1983, and completed 22 of them. It rejected two of them and invited further action on six revision projects.

IPC Revision Projects on the Program for 1984/1985. The Working Group noted the IPC revi-

* A list containing the titles and functions of the participants may be obtained from the International Bureau.

* Prepared by the International Bureau.

sion projects recommended for the IPC revision program for 1984/1985, the actions on those projects and related deadlines.

X-Notations. The Working Group considered a certain number of X-notations, allotted by various industrial property offices, and approved amendments to various IPC subclasses, which will permit appropriate classification according to the fourth edition of the IPC to be allotted to the patent documents in question.

New Presentation and Layout of IPC Notes. The Working Group approved the French version of those notes of the IPC for which a new presentation and layout had been approved in English at the ninth session of the Working Group and the English and French versions of the remainder of the notes.

Amendments to References in the IPC. The Working Group set forth the deadlines for actions relating to the checking of references in the IPC, which is necessary as a consequence of the amendments agreed upon during the current revision period.

Amendments to Class and Subclass Indexes. The Working Group set forth the deadlines for actions relating to the checking of the IPC class and subclass indexes, which is necessary as a consequence of the amendments agreed upon during the current revision period.

Pilot Project in IPC Class C 12. The Working Group agreed on a final evaluation of the effectiveness in developing the common computerized search file in the area of IPC class C 12, i.e., the area relating to subclasses C 12 M, N, P, Q and R.

LIST OF PARTICIPANTS*

I. Member States

Denmark: H.J. Petersen. **Finland**: H.I. Lommi. **France**: A. de Pastors; P. Viala; L. Hornik; M. Lavé; M. Lyon. **Germany (Federal Republic of)**: H. Höper; H. Hampl; K. Molewski; W. Ruf; E. Moritz. **Japan**: T. Itagaki; S. Ono. **Norway**: O. Os. **Soviet Union**: V. Belov. **Spain**: J.D. Vila Robert. **Sweden**: J. von Döbeln. **Switzerland**: E. Caussignac; J. Borloz. **United Kingdom**: K.E. Butterworth; R.E. Hardy. **United States of America**: T.F. Lomont; P. Sullivan.

II. Member Organization

European Patent Office (EPO): E. de Bundel; F. Borms; J.F.C. Atkins.

III. Observer Organization

International Federation for Documentation (FID): H. Knoll.

IV. Officers

Chairman: K.E. Butterworth (United Kingdom). *Vice-Chairmen:* J.D. Vila Robert (Spain); J. Borloz (Switzerland). *Secretary:* B. Hansson (WIPO).

V. International Bureau of WIPO

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* A list containing the titles and functions of the participants may be obtained from the International Bureau.

General Studies

The Agritechnical Criteria in Plant Breeders' Rights Law*

N.J. BYRNE**

Distinctness, uniformity and stability, along with commercial novelty, are the basic criteria of plant protectability under the Plant Varieties and Seeds Act 1964 and under similar laws in other countries.[1] These criteria are to breeders' rights law what novelty and inventiveness are to industrial patent law. They are the very core which must be thoroughly understood by advisers working in this important, relatively new field of intellectual property—wherein protectable subject matter consists of a distinct, uniform and stable (hereafter referred to as "d.u.s.") group of plants which is novel in the sense that, when breeders' rights are applied for, material of the applied for variety has not been commercialized within the meaning of Rule 2, Part II of Schedule 2 to the Act.[2]

An essential prerequisite for even a superficial understanding of the d.u.s. criteria is an appreciation of cultivated plants, how they work and reproduce themselves, and the principles of inheritance in plants.[3] Without that elementary grounding in botany, the lawyer may not be able to understand the breeder, whose language, necessarily when he talks of his plants, is replete with technical terms and their implications.

The difficulty in finding a legal adviser who understands what breeding a new plant involves and what confronts the breeder when trying to protect and exploit the varieties he creates almost certainly drives a good many breeders to their own, at times far from satisfactory, devices. Regrettably, few lawyers in the field of intellectual property have bothered to educate themselves in breeders' rights law, to grasp what in reality is an opportunity going begging, since nearly all the main industrial countries have breeders' rights systems on their statute books. The remainder, and some developing countries, are either debating the introduction of a system or about to legislate for one.

Further incentive for lawyers is in the fact that, with the economically important crop species, plant breeding is already big business; and many big firms, such as those in the oil business, have bought into the industry for a toehold to the future. With 5,000 million mouths to feed at present, 6,500 million by the year 2000 and between 8,000 and 15,000 million next century (so estimated the *Brandt Commission*, February 1980), the prospects for firms breeding food crops and industrial plants can hardly be other than very attractive.[4] And if plant breeders can adapt genetic engineering or DNA (deoxyribonucleic acid) techniques as a means for the creation of wonder plants, to quote the *Economist* (December 5, 1981), then "excitable market forecasters promise them billions of dollars in sales for their products."[5]

The Creation of New Varieties

Those who are not familiar with the plant breeding industry may appreciate it if we divert awhile from our

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* This study was submitted for publication in November 1982 and analyzes the state of the law up to that date.

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[1] This study is based on the Plant Varieties & Seeds Act 1964 (hereinafter the "Act of 1964"), the basic law regulating the granting of *plant breeders' rights* (a special title of protection) in the United Kingdom; it does not take into account the recent amendments introduced by the Plant Varieties Act 1983. The Act of 1964, like similar laws in other countries, is modeled on the International Convention for the Protection of New Varieties of Plants (1961). On the Act of 1964 see: Smith, L.J., "International Convention for the Protection of New Varieties of Plants," *Industrial Property*, 1965, p. 275; Byrne, N.J., "Plant Breeders' Rights in Biological Varieties," 8 CIPA 2 (1978); Murphy, P., "Plant Breeders Rights in the United Kingdom," (1979) EIPR 236; Royon, R., "The Limited Scope of Breeders' Rights," (1980) EIPR 139; Dworkin, G., "Plant Breeders' Rights—The Scope of U.K. Protection," 4 EIPR 11 (1982); Byrne, N.J., "Plant Breeders' Rights—A Benefit or a Burden to the Community?," 4 EIPR 93 (1982); Cornish, W.R., *On Intellectual Property*, Sweet & Maxwell, London, 1981, pp. 613-617.

[2] The "no prior commercialisation" rules are beyond the scope of this study—which, as its title states, is concerned with the agritechnical criteria of distinctness, uniformity and stability (d.u.s.).

[3] There is a vast literature on the subject, but the lawyer might care to refer to the following few books and articles: Gill & Vear, *Agricultural Botany*, 1958; Lawrence, W.J.C., *Plant Breeding*, 1968; Curtis & Johnson, "Hybrid Wheat," *Scientific American*, May 1968; Rick, C.M., "The Tomato," *Scientific American*, August 1978; North, P., "Plant Breeding as a Hobby," *The Garden*, November 1979; North, C., *Plant Breeding and Genetics in Horticulture*, 1979; Huxley, A., *Plant & Planet*, 1978; Allard, R.W., "Plant Breeding," *Encyclopaedia Britannica*, 1981; "Pollination," *Encyclopaedia Britannica*, 1981; "Plant Reproductive Systems, *Encyclopaedia Britannica*, 1981.

[4] Wilkes, G., "Plant Breeding to Feed a Hungry World," *Encyclopaedia Britannica Yearbook of Science and the Future*, 1982; *Feeding the 5000 Million*, ASSINSEL (International Association of Plant Breeders), Geneva.

[5] "Breeding Better Crops," *The Economist*, December 5, 1981.

concern with the d.u.s. criteria and say something of bow the breeder might set ahout creating a new variety. Breeders' rights law does not concern itself with tbe means hut with the result, in this sense that howsoever hred, or wheresoever discovered, a variety is protectahle if it is covered by a scheme made under the Act of 1964 and satisfies the basic criteria.[6] This is made clear in the Act which gives the right to apply for breeders' rights to the person who bred the variety or who discovered the variety in a cultivated tract or found it growing in the wild or occurring as a genetic variant, whether artificially induced or not.[7]

The cornerstone of all plant breeding is *selection*; by which is meant the process wberein the hreeder endeavors to pick out plants with the best comhinations of desirahle characteristics. This process of selecting the best plant or plants from one group or more usually runs over several years at least before the hreeder arrives at, if at all, what has been defined in the hreeding program.

But how does the hreeder create the diversity he needs in order to begin the process of selection?[8] *Hybridization* is perhaps the best-known method and arguahly still the most widely used hy hreeders. The plant bybridizer artificially crosses or mates different albeit selected plants and from the immediate progeny (F1) of the cross or from a later generation be selects the desired variety. The selected variety must then be multiplied to hulk quantities (i.e., hulked-up) for the seed, cuttings or whole plant trade.[9] Among the earliest hybridizers was Andrew Knight who, in England, around the mid-1700s produced notable varieties of fruit and other crops.

When working with species sucb as chrysanthemum, the hreeder might take progeny of the cross, bomhard them with X rays or subject them to mutagenic agents to speed up the rate at which the species mutates under natural conditions, and then begin to select for the desired variety.[10] This is known as *mutation breeding* and valuable varieties have been created in this way. South American lupins, for example, plants which are rich in proteins yet have a poisonous alcaloid which protects them against foraging animals, were irradiated and mutants poor in alcoloids are now being hred.[11] If you are lucky, though as Pasteur once said, "Cbance favors the prepared mind," you may cbance upon a valuahle mutant in Nature's bounty and growers of sucb species as rose, carnation and chrysanthemum are ever-vigilant for "sports."

In *polyploid breeding* the aim is to increase the number of complete sets of chromosomes. Polyploidy can be induced in various ways, including by the use of cbemical agents among which the drug "colchicine" (derived from corms of the autumn crocus) is said to be a highly effective agent. Many cultivated plants are polyploids—they have more than two basic sets of chromosomes. The cultivated banana is at its most vigorous in the triploid state. The sterility which accompanies triploidy renders the fruit commercially acceptable, unlike tbe hasic diploid which sets hard seeds. Due to sterility, the hanana has to be propagated vegetatively as a clone.[12]

The experienced plant breeder has of course an intimate knowledge of both the plant species he is working with and related species. Our needs for understanding the meaning given to plant variety in the Act of 1964—that is, "any clone, line, hyhrid or genetic variant"—can be served merely hy an outline of how plants reproduce and some limitations they impose on the hreeder. In applying the agritechnical criterion of uniformity to the variety in respect of which legal protection is sought, the granting authority must have regard to the particular features of the variety's sexual reproduction or vegetative propagation.

Cultivated plants are either predominantly self-pollinated or largely cross-pollinated. In sexual reproduction, after the essential preliminary of pollination, the male and the female cells unite to form a zygote. A large number of *vascular* plants—sucb are what most of us would regard as plants, as against the "lower" organisms like algae and fungi which debatably are not plants in everyday parlance[13]—can reproduce themselves, and by man be reproduced, asexually as well as sexually.

[6] Al present, there are over 40 breeders' rights sehemes embracing several hundred species of plant.

[7] Section 2, Act of 1964.

[8] It is not possihle to select where there are no apparent variants, or differences, in a group.

[9] The variety must not of course be commercialized prior to application for rights.

[10] Broertjes, Koene & Van Vcen, "A Mutant of a mutant of a mutant of a ...," 29 *Euphytica* 525 (1980), on mutation breeding with chrysanthemum species.

[11] Blum, R. E., "The Threat to Our Environment and the Protection of Intellectual Property," *Industrial Property*. 1972, p. 243, cites this example and others.

[12] A plani which propagates, or has been propagated, vegetatively (or asexually) is known as a clone; it is a precise perpetuation of the genotype of the "parent" plant, an exact genetic replica of the "parent." Among the higher (vascular) plants, vegetative propagation proceeds naturally by means of tubers (for example, the Irish potato), bulbs (the tulip), rhizomes (such as the banana), and corms (like the crocus). Strawberries propagate themselves by means of stolons or runners which colonize suitahle territory. In addition to these natural means, man, the cultivator, intervenes to propagate plants vegetatively by artificial means, among which cuttings and graftings have been the more important since ancient times. Many herbaceous and woody perennials, being highly heterozygous, have to be propagated vegetatively because they will not come true to type from seed. Included in this group are most fruit and nut cultivars, such as peach, apple, and pear, many herbaceous ornamentals, such as tulip, dahlia and chrysanthemum, and numerous woody ornamentals, such as rose and camelia. Vegetative propagation is more correctly a type of asexual reproduction than a synonym of it. All the Cox's Orange Pippin apple trees in exisience iogeiher form a clone, for example.

[13] Byrne, N.J., "Fifty Years of Botanical Plant Patent Law in the U.S.," 4 EIPR 116, 122 (1981), takes this point further. Laclavière, B., "The French Law on the Protection of New Plant Varieties," *Industrial Property*, 1971, p. 44, states that the French Law of 1970, "was designed with sufficieni scope to cover all species in the plant world, including plants of the lesser orders such as mushrooms and bacteria. However, its actual application will be strictly progressive, since it will be contingent on the progress of scientific knowledge and of the means of examination and verification." Byrne, N.J., "Patents on Life," (1979) EIPR 297, writes that whai the legislature had in mind when it passed the Act of 1964 were the seed-bearing vascular plants and that the scope of the Act does not really embrace the lower organisms. It is understood, however, that a seheme under the Act of 1964 is being considered for the protection of mushrooms.

Primarily, however, plant reproduction is either sexual or asexual. A plant propagated asexually is a clone.

Since, to quote Charles Darwin, "continued self-fertilization is a poor strategy for long-term survival," the vast majority of plant species are natural outbreeders. When closely related parents meet, inbreeding occurs. A plant is said to be self-pollinated, a "selfer," if pollen is transferred to it from any flower of the same plant. Thus that plant is at the same time both mother and father to its offspring. Selfers are highly uniform, reproducing true to varietal description year in, year out. Outbreeders are inherently variable types; however, genetic variability in a crop species may serve as a huffer against hostile environment or diseases. The outhreeder, it is said, adapts better to long-range changes in the environment; the inbreeder, though genetically less flexible, is capable of high immediate fitness.

The work of the hreeder may be limited hy the fact that the higher, vascular plants have evolved various genetic mechanisms for encouraging inbreeding or outbreeding. It must be said, however, that far more such mechanisms exist to discourage inbreeding than encourage it. In creating a new variety, the hreeder may have to overcome these mechanisms.

Over half of the more important cultivated plants are naturally cross-pollinated. If you force a natural outbreeder to inbreed, say the carrot, reduced vigor and fecundity in the offspring of this non-natural union must be expected. They may be smaller in size, and increasingly defective or morbid; albinos, dwarfs, infertile offspring and rootless seedlings commonly result from enforced inbreeding. Surviving offspring, while showing a general decline in vigor and size, become increasingly more uniform in their morphological and functional traits.

Seeds result from sexual union between male sex cells (in the pollen grains) and female sex cells (in an ovule, within the plant's ovary). After fertilization, an ovule develops into a seed complete with a diet of carhohydrates, proteins, fats and minerals for the embryo within. Some plants protect their seeds with large and fleshy fruits.

Seeds are most obviously a major source of food for man and beast, hut we should not forget that they may have important industrial uses. Oil-bearing seeds come from such crops as flax and castor. Oil from palm seed is still used for, among other things, metals processing. Castor oil as well as being a fine lubricant is also a source of chemicals. Finally, seeds are the source of a new generation and an essential element in the development of new and improved varieties.

The risks which a firm faces in hreeding new plants are certainly no less, and may even exceed, what confronts the inventor of a new drug. The modern plant breeder is a true inventor.

What "Plant Variety" Means

Breeders' rights laws in some countries do not define "plant variety," thereby, it is arguable, facilitating administrative and judicial development in the light of technical progress. The Act of 1964, however, defines it as "any clone, line, hyhrid or genetic variant."[14] The idea of a variety implies a distinct and stahle group of plants which are similar or identical in their characteristics. The term *variety* is the exact equivalent in English of cultivar *(cultivated variety)*; and the cultivar is the basic taxonomic unit for cultivated plants.

The meaning assigned to plant variety in the Act of 1964—which meaning, for ease of reference, will hereinafter be known as the "statutory meaning"—is close to the 1961/1972 text in Article 2(2) of the *International Convention for the Protection of New Varieties of Plants*, or the *UPOV Convention.* Article 2(2) is hased on a provision of the voluntary *International Code of Nomenclature of Cultivated Plants* (1958).

The 1978 text of the amended UPOV Convention has abandoned the categorization of varieties found in the statutory meaning; and a proposal that variety he defined in terms of an "assemblage of plants" was rejected hy governmental delegates at the Geneva Diplomatic Conference on the Revision of the International Convention for the Protection of New Varieties of Plants, 1978.[15] It seems worthy of note that the International Code of Nomenclaturc, in its 1969 text, explains in Article 10 that cultivar denotes an assemblage of cultivated plants which is clearly distinguishable by any characters (morphological, physiological, cytological, chemical or others), and which, when reproduced (sexually or asexually) retains its distinguishing characters.[16]

So we can see that the statutory meaning does not so much define the term "plant variety" as list several varietal types.[17] And the statutory meaning does not *include* types—it comprises those types only. Since, however, the United Kingdom delegation to the 1978 Geneva Diplomatic Conference on the revision of the Convention favored a wider definition of variety and argued for one based on "assemblage of plants," it would surely support either deletion of the statutory meaning

[14] Section 38(1). Breeders' rights laws in Switzerland (see *Industrial Property Laws and Treaties*, SWITZERLAND—Text 1-001), Spain (*Ibid.*, SPAIN—Text 1-001) and the Federal Republic of Germany (*Ibid.*, GERMANY, FEDERAL REPUBLIC OF—Text 1-001) say that plant variety means "any cultivar, clone, line, stock or hybrid." Canadian law says the term means "any cultivar, clone, breeding line or hybrid." Spanish law defines "stock" as descendants of plants of one and the same origin obtained by breeding, which possess numerous common characteristies.

[15] *Records of the Geneva Diplomatic Conference on the Revision of the International Convention for the Protection of New Varieties of Plants 1978*, UPOV, Geneva, 1981. The main amendments to the Convention are discussed in "Summary of the Main Amendments to the Convention," *Industrial Property*, 1979, p. 33; see also Royon, R., note 1 *supra*, for criticism.

[16] *Cf* the definition in the Spanish rules (Section 2) implementing the breeders' rights law of 1975, *Industrial Property laws and Treaties*, SPAIN—Text 1-001.

[17] Implicitly of course it defines variety by listing these different types. Also, albeit indirectly, the d.u.s. rules of protectability in the schedules to the Act of 1964 define "variety."

or at least use of the word "includes" instead of "means" in the statutory meaning.[18] Arguably, the existing statutory meaning inhibits technical progress since, for example, it does not cover the *multiline* variety, an important type.

Varietal Types in the Statutory Meaning

The concept of the *line* is an old one.[19] The line variety comprises self-fertilized plants; and an *inbred* line variety comprises naturally cross-fertilizing plants kept as "selfers" by artificial restraints on cross-pollination. The International Code of Nomenclature (1969) explains that a cultivar may consist of "one or more similar lines of normally self-fertilizing individuals or inbred lines of normally cross-fertilizing individuals." Inbred lines are generally used to produce hybrid cultivars.

A *pure* line variety is derived from the seed of a single, superior plant selected for yield and performance.[20] It comprises genetically identical offspring of a single, self-fertilized, homozygous plant. Apart from mutations, the progeny are genetically identical to the homozygous parent and to each other. Thus selection within a pure line is not feasible, since hereditary differences will not exist there. And cross-fertilization between plants of the same pure line would achieve nothing either, as like combined with like is without effect.

A pure line reproduces its traits just as regularly and fully as a clone variety. But there is the risk with a pure line that it will be eliminated by a hostile environment or diseases. As a possible buffer against that, the breeder could constitute his variety with several morphologically similar lines.

Selfing an outbreeder produces inbred lines, though severe depression and a high mortality rate often follow such selfing. Some normally cross-fertilizing species such as sunflowers and rye are said to be more tolerant of inbreeding than other such species as the carrot. The inbred line variety, for several reasons including stability and vigor, frequently consists of selected progeny lines, not too closely related but adequate in number to avoid the ill effects of excessive inbreeding.

The Code of Nomenclature (1969) refers to a cultivar "consisting of an assemblage of individuals reconstituted on each occasion by crossing. This includes single crosses, double crosses, three-way crosses, top crosses and intervarietal hybrids" (Article 11). *Hybrid* types have been developed in both the self- and the cross-pollinated species. Male sterility (genetic and cytoplasmic) has made economical the breeding and production of hybrids in a wide range of plants. The sterile line is crossed with the desired male parent to produce the first generation (F1) hybrid. When male sterility is cytoplasmic, both parent and offspring plants are sterile. This condition is said to be advantageous in flowering ornamentals, as the sterile plants tend to bloom longer and their blooms stay fresh for longer.

Hybrid development in cross-pollinated species usually involves the crossing of selected inbreds, each line different from the other(s) but purebreeding and highly uniform. The most vigorous hybrids tend to be those between inbred lines which are neither closely nor distantly related. Hybrid vigor, or heterosis, the converse of inbreeding depression, may be manifested variously at F1 by increased size, increased growth rate, greater productivity, increased resistance to insects and diseases, more or bigger leaves or pods, or earlier maturity.[21]

Several hybrid types exist. If two inbred, homozygous lines (A, B) are crossed (AxB), the F1 is a single-cross hybrid. When two F1 single-crosses, (AxB) and (CxD), are crossed—(AxB) (CxD)—the result is a double-cross F1 hybrid. In three-way crossing, an F1 (AxB) is mated to an inbred line (C) to produce an (AxB)C hybrid. Top-crossing is used in the selection of inbred lines for general combining ability. Lines that perform well when mated to a common pollen parent are used in the production of a superior double cross.

A chip off the block, so to speak, the *clone* variety is described in the Code of Nomenclature (1969) as a genetically uniform assemblage of individuals (which may be chimeral in nature) derived originally from a single individual by asexual propagation, for example by cuttings, divisions, grafts or obligate apomixis.[22]

Lastly, a *genetic variant* may arise spontaneously under natural conditions.[23] Mutation breeding, in which mutagenic agents or substances are applied to plants, may induce variants in a plant. Plant species such as carnation and chrysanthemum tend to mutate and sport

[18] Or, as this might introduce the desired flexibility to the Act of 1964, add the term "cultivar" to the statutory meaning.

[19] Weiss and Little, "Variety Is A Key Word," *Yearbook of Agriculture* 1961, U.S. Department of Agriculture, discuss the concept of "variety" at length and in detail.

[20] As per note 16, *supra*.

[21] The hybrid cultivar is an inherently unstable type. The F1 (or first filial) generation, though uniform, is a heterozygous population. Say, two varieties of garden pea (a normally self-pollinating species) are crossed, Txd (tall x dwarf), to produce the seed from which the F1 generation is then grown. All the F1 plants grown from the seed are tall, contrary to what a person untutored in plant inheritance might have expected. These plants self-pollinate in the normal way, setting seed for the F2 generation. If this is sown, the resulting progeny will segregate in the proportions 3:1, tall: dwarf. In other words, there will be 75% tall plants and 25% dwarf plants. Dwarfness, though dominated by the tallness factor or gene before, reappears at F2. The uniformly tall plants comprise homozygous tall plants (25%) and heterozygotes (50%). Thus because the group of tall plants has residual heterozygosity, there will be further segregation at F3. The variety resulting from the initial cross is not stable for tallness.

[22] Apomixis is a somewhat unique asexual method found with some plants, notably in the grass family. The process may look sexual, particularly if pollination is needed to stimulate it, yet apomixis is truly asexual. An apomict derives its genetic constitution solely from the "mother" plant. The asexual seed is in reality an ovule that has been matured outside of the normal process of fertilization. An obligate apomict is a plant that produces only apomictic embryos.

[23] See the Engholm Committee's Report on *Plant Breeders' Rights*, July 1960, Cmnd 1092, HMSO London, at para. 244, p. 62.

quite readily and, since prized plants can come that way, breeders and growers of such species look out for genetic variants. If a variety from a species prone to mutate spontaneously is released prematurely to the market before it has been through an extensive mutation program, the breeder risks a valuable mutant falling into the hands of competitors. His rush to the market could be commercially suicidal.

The *synthetic* variety is constituted from selected, genetically distinct but morphologically similar lines or clones which are interplanted and allowed to intercross free from foreign pollen. It is very similar, genetically, to an open-pollinated variety. Each synthetic so produced may be distinct in respect of certain traits (such as disease or insect resistance) but highly variable in respect of other characteristics.

The identity of a synthetic is preserved by limiting the generations over which it may be multiplied. That, along with recourse to breeders' seed, is said to be the only practical means of preserving the genetic characteristics originally bred into the synthetic. Can a synthetic variety be protected under the Act of 1964? Does it come within the statutory meaning? Arguably, it cannot and does not.[24] Do not confuse the synthetic variety with the lines or clones used to constitute it. These may be separately protectable if they meet the legal and technical criteria.

The *multilinear* variety is not yet protectable under the Act of 1964 and it is difficult to see how the concept would fit within the existing statutory meaning. Again, this is not to say that the lines which constitute the variety are not separately protectable.

The Agritechnical Criterion of Distinctness

We have come by degrees and a few necessary diversions to what is the principal agritechnical criterion: distinctness. It is in a sense a criterion of "novelty." The rule that an applied for variety under the Act of 1964 must be distinct is put in tbe statute as:

> "The variety must be clearly distinguishable by one or more important morphological, physiological or other characteristics from any other variety whose existence is a matter of common knowledge at the time of the application.
>
> "Common knowledge may be established by reference to plant varieties already in cultivation or exploited for commercial purposes, or those included in a recognised commercial or botanical reference collection, or those of which there are precise descriptions in any publications."

Form or outward appearance is the concern of morphology. The applied for variety may differ clearly from other commooly known cultivars by ooe or more readily identifiable traits. Usually more than one cbaracteristic lends distinctness to a variety. Flower color; shape or length of leaves, pods or petals; size, shape or color of fruit (a square-shaped tomato has been bred in the United States of America) or seed; branching habits; pollen morphology—any one or more of these among innumerable plant traits might help distinguish a variety from the common stock. Chromosomal peculiarities might also help in that. Physiological traits like early maturity; resistance to environment, diseases or chemical sprays; low temperature response or performance—these as well as being culturally valuable characteristics may help differentiate a variety.[25] A few years ago, it was reported in the press that two new perennial ryegrasses had been developed which showed total resistance to chemical weedkillers. Lawn-keeping should be much less backbreaking when this trait is successfully bred into lawn grasses.

UPOV Test Guidelines

A character must be precisely recognizable and describable before it could be called "important" to the task of clearly distinguishing a variety. Thus such subjective traits as taste and smell, for example, a "better tasting" onion, traits which vary according to one's imagination would not be acceptable for descriptive or distinguishing purposes—a rose by any other name might not smell as sweet (*contra* Shakespeare, *Romeo and Juliet*).

The Union for the Protection of New Plant Varieties (UPOV), at Geneva, publishes test guidelines which are intended to provide States of the Union, which include the Member States of the European Communities, with a common basis for testing varieties and establishing varietal descriptions in a standardized form, the aim being to facilitate international cooperation in examination for distinctness, uniformity and stability (d.u.s.).

If a country accepted for distinguishing purposes characters which could not be fairly precisely defined, or perhaps definable by expensive, controversial procedures, this would prejudice the whole system. It would cause considerable problems for international trade in reproductive material (seed, cutttings, whole plants).

The guidelines—normally separate test guidelines are prepared for each plant species and regularly updated to take account of technical progress and new insights on the species—are also meant to assist applicants for

[24] In "Summary of the Main Amendments to the Convention," note 15 *supra*, it is said that synthetic varieties are "not yet protected as such in the States of the Union."

[25] In *Re Maris Druid Spring Barley* (1968) FSR 559, the applied for variety was held to be distinct on the basis of mildew resistance to a certain strain, even though such resistance was difficult to determine in view of the variability of mildew strains. *Quaere*, whether in the light of the *Daehnfeldt* decision, *infra*, this character would be "important." The Danish Law of 1962 mentions in the distinctness criterion "such internal characteristics as resistance, content of valuable matter (dry matter, oil, etc.) and suitability for special modes of treatment." The U.S. Plant Variety Protection Act 1970 refers to "processing or product characteristics, for example, milling and baking characteristics in the case of wheat" (on the reason for including this, see *Congressional Report on the Act 91-1605*). On the Act of 1970: Rollin, S.F., "U.S. Plant Variety Protection Act," *Industrial Property*, 1972, p. 169; Williams, S., "Securing Protection for Plant Varieties in the USA," 8 EIPR 222 (1981).

breeders' rights by giving them information on the characteristics to be studied and on the questions which they will be asked about their varieties. The *General Introduction to Guidelines* (UPOV TG/1/2) makes it clear that the characteristics in any given set of guidelines are not exhaustive but may be enlarged by further traits if this proves useful.

The characteristics listed in the test guidelines for a species are those which are considered to be important for distinguishing one variety from another and whicb are therefore also important for the examination of uniformity and stability. They are not necessarily qualities indicative of a certain value that the variety may possess. Thus the characters by which an applied for variety is distinguished from other commonly known types may be culturally valueless.

If we take a set of guidelines by way of example, a better idea should emerge of their content and, as regards the species involved, of what characteristics the experts regard as important for distinguishing purposes. The guidelines for perennial chrysanthemums (UPOV TG/26/4) list 63 cbaracteristics for observation by the breeder or the testing authorities when determining the distinctness of chrysanthemum cultivars. One character on the list calls for information about plant height. Five stem characteristics, including the color of the plant stem (color in terms of the RHS Colour Chart, on which each color has a reference number) and the strength and brittleness of the stem, are listed. The list includes 13 leaf characters—width, ratio length/width, thickness, texture and color being among these. Further still down the list are characters relating to the flower head and its constituent organs. Slowly as you go down the list, recording against each character on it the pertinent detail disclosed by your variety, an identity for the chrysanthemum under observation emerges.

All the characters listed in UPOV TG/26/4 may not be relevant to your chrysanthemum, though a majority of them will be. Other characters not listed might well be added. And those listed may bave to be tested or observed and recorded at a particular stage of the plant's development.

The Growing Trial

In order to appreciate distinctness, as well as to test uniformity and stability, you really need to grow the variety over a period. A written description may aver to the distinctness of a variety in great detail yet fail to imprint it properly on the reader's mind. A variety may look quite different from other cultivars when you see them growing before you, yet you may find yourself at wit's end if called upon to describe what you see.

It is the practice of the granting authority under the Act of 1964 (Plant Variety Rights Office (PVRO), Cambridge), and that also of granting authorities in the other Member States of the European Communities, though not of those in the United States of America, for example, to test the applied for cultivar in growing trials for conformity with the d.u.s. criteria. The UPOV guidelines for the species give details on how such a test should be conducted.

UPOV TG/1/2 states that two varieties should be considered distinct if the difference has been determined at least in one testing place, if it is clear, and if it is consistent. Article 7 of both the 1961/1972 and the 1978 texts of the UPOV Convention says rights sball only be granted after examination of the variety and that for the purposes of sucb examination the breeder may be required to fumish all the necessary information, documents, propagating material or seeds.

The founding States of UPOV bave read Article 7 to mean that the granting authority in a member State must grow the applied for variety. But a pre-conference report to the Geneva Conference (1978) by a Committee of Experts—document DC/3, Annex II, January 30, 1978, UPOV Council—states that, if the competent authority were to require these tests to be conducted by the applicant, that would be in keeping with Article 7 provided that (a) the growing tests are conducted according to the guidelines established by the autbority, and tbat tbey continue until a decision on the application has been given; (b) the applicant is required to deposit in a designated place, simultaneously with his application, a sample of the propagating material representing tbe variety; (c) tbe applicant is required to provide access to the growing test by persons properly authorized by the competent authority. Failure to give such access would lead to the application being rejected.

The granting authority for tbe United Kingdom, the PVRO at Cambridge, might consider shifting over generally to tests conducted by the applicant, as a possible way to saving on the costs of obtaining breeders' rights protection. Other member States of UPOV, where the granting authority officially tests applied for varieties, could make a similar move. Granting authorities should be able to test the variety on their own grounds if there is any doubt.

Distinctness in the *Daehnfeldt* Case

An insight on how the d.u.s. criteria are applied in practice by the granting autbority for the United Kingdom emerges from the case *Daehnfeldt v. Controller of Plant Varieties* (1976).[26] This was an appeal from a decision of the Controller to the Plant Variety Rights Tribunal. The decision refused an application for breeders' rights in respect of an Italian ryegrass variety named PREGO.

The issue for the appeal tribunal was wbetber PREGO was sufficiently distinct from the varieties

[26] Fleet Street Reports (FSR) 94.

TIARA and VEJRUP MB. The examiners had been unable to distinguish clearly the applied for variety under test from these two prior cultivars of the same species. A high measure of distinctness must be shown for an applied for variety as contrasted with other known or listed varieties. It is for an applicant to establish that his variety matches up to the relevant requirements. A few minor, sporadic differences are not enough to distinguish a variety.

Daehnfeldt had argued that, since PREGO had in fact been shown to be sufficiently distinct in the Federal Republic of Germany and Denmark, both member States of UPOV, and had qualified for breeders' rights there, refusal by the United Kingdom authority of the application implied that the testing authorities in the other two countries had come to their respective decisions on a false basis. The appeal tribunal did not hesitate to reject such a flawed argument.

In fact, the tribunal knew that the German authority had not compared PREGO and VEJRUP MB; and that the results of tests in Denmark between PREGO and each of the prior cultivars were very hare and uninformative. But in any event, said the tribunal, the fact that rights had been granted on PREGO in those countries was not a reason for regarding the variety as satisfying the criteria in the Act of 1964. Why the applicant pressed the refusal to an appeal was because it endangered his rights in the Federal Republic of Germany and Denmark. It is believed that subsequently, in the Federal Republic of Germany, his rights were revoked.

Winterhardiness, a trait of significant *cultural* value, was argued by the appellant to distinguish clearly his variety from any other comparable cultivar. The Danish authority, he said, had shown this characteristic to exist as against VEJRUP MB though the authority did not test for it as against TIARA.

Some allegedly distinguishing traits are difficult, if not practically impossible, to verify properly and acceptably; and in *Daehnfeldt* winterhardiness was one such. When testing for it, the authority had to bear in mind various factors such as heavy rainfall, sleet and high winds typical of winters in the United Kingdom. These were not easy to assimilate, the tribunal said, and up to then they had not in fact been assimilated in any reliable test procedures. Certainly the UPOV test guidelines for the species did not regard winterhardiness as a relevant or reliable characteristic in the assessment of distinctness; and in any event, the tribunal added, those guidelines are persuasive only, without legal force to them in the United Kingdom.

Where the rule speaks of *important* characters, it means important from the point of view of distinguishing clearly between varieties. Whether important for the purposes of *cultivation and use* involves an issue within the province of plant and seed control measures when a species is subject to the seed laws.

A varietal character is "important" within the meaning of the distinctness rule if it is a character (a) the assessment of which is practicable, that is to say, one which can he assessed hy tests which do not involve disproportionate or unreasonahle expenditure of effort, space or cost; (b) which can be assessed at will, that is to say, its testing must not depend on a particular set of weather conditions which may occur only rarely; (c) which is assessahle by tests which give reasonably consistent and repeatahle results in different years and at different test stations in the United Kingdom, taking into account the fact that differences in locality and in weather conditions may affect the results; (d) which, in the case of a cross-pollinated plant like Italian ryegrass in which there is a suhstantial amount of difference between individual plants of the same variety and in which most of the differences between plants and between varieties are quantitative in nature, can be assessed in such a way as to take into account the variation between individual plants of any one variety.[27]

The examiners in *Daehnfeldt* assessed the intervarietal differences using a statistical technique, the analysis of variance, but found no significant differences between PREGO and TIARA or VEJRUP MB. In the case of a herhage variety, distinctness requires that there be consistent statistical differences hetween the applicd for variety and other known cultivars—so that positive identification of a sample of sced of unknown or douhtful origin can be made with a high degree of certainty. One might add that exclusive rights (whether a patent or hreeders' rights) may not be granted in respect of what is not readily identifiahle. And if a variety is not readily identifiahle, then it is difficult to see how the hreeder can defend it against unauthorized exploitation.

As no consistent statistically significant difference could he found hetween PREGO and the cited prior art, if a specialist were to be given a sample purporting to he PREGO he would not be ahle to say whether it was or was not of the PREGO variety. Even on the hasis of characters advocated by the applicant, the applied for variety was not clearly distinguishahle.

[27] For quantitative characters a number of plants (60 in the U.K., 50 minimum in the UPOV guidelines) are chosen at random and measured, and the mean value, a sample mean only, used. With such relatively small samples the mean of one random sample may by chance differ widely from that of another sample of the same variety. The true variety mean is always unknown, since it could only be obtained by measuring an infinite number of plants of the variety; hence of course an absolute difference between the true means of two different varieties cannot be obtained. There is, however, an accepted statistical technique, the analysis of variance, which, by comparing the variation within a sample with that between samples, allows the calculation of the probability of an observed difference between two sample means being a true difference, and not a false one due only to chance. Absolute certainty is not obtainable, but a 99 percent probability is normally accepted as satisfactory. A difference between two varieties which reached a statistical significance of only 95 percent probability would not satisfy the distinctness criterion in the Act of 1964 (FSR 94, at 102). UPOV TG/1/2 puts it, where distinctness depends on measured characters that the difference should be considered clear if it occurs with one percent probability of an error, for example, on the basis of the method of the Least Significant Difference.

The Agritechnical Criterion of Uniformity

The question whether a variety is distinct is really asking whether a group of plants differs clearly from prior, commonly known varieties. If within the group some individuals differ from the rest, this may call into question whether the variety applied for is sufficiently uniform and stable to qualify for a grant of breeders' rights. The rule of homogeneity in the Act of 1964 requires that a variety be sufficiently uniform baving regard to the particular features of its sexual reproduction or vegetative propagation. UPOV TG/1/2 tells us that thc variation shown by a variety, depending on the breeding system of the variety and off-types due to occasional admixture, mutation or other causes, must be as limited as necessary to permit accurate description and assessment of distinctness and to ensure stability. Thus variation is tolerated within limits, defined by the reproductive system of the variety—vegetatively propagated, self-fertilized, or cross-fertilized.

It is worth mentioning that uniformity of economic traits is a primary goal of plant breeding because, in mechanized agriculture and horticulture, field operations are much easier when the individuals of a variety are similar in time of germination, growth rate, size of fruit and so forth. When crops such as tomatoes and peas are harvested mechanically, it is essential tbat the maturing characters are uniform. And no doubt uniformity of size, shape, taste appearance and keeping qualities helped the French "Golden Delicious" apple to dominate the British market in eating apples.

Tbe *ZEPHYR* Case on Uniformity

When a variety is self-fertilizing (e.g., the garden pea) or if it is an F1 hybrid or if it is a clone (e.g., fruit trees, decoratives like the rose and tbe cbrysanthemum), uniformity is seldom a serious problem. Cross-fertilized species can be problematical, however. The issue in *Re ZEPHYR Spring Barley* (1967),[28] a predominantly self-pollinated plant, concerned the way in wbich the homogeneity rule was applied to the variety *in casu*.

The examiners rejected the application for lack of uniformity and stability in the applied for variety, on the basis of growing trials at three centers in the United Kingdom using plant material of the variety supplied by the applicant on two occasions in 1965. The variety was distinct, the examiners admitted, but due to the number of variants arising in tbe growing plots it could not be regarded as sufficiently uniform.[29] Lack of sufficient stability was evinced by segregation and differences between the morphological characters of plants grown from seed submitted in 1965 and 1966. The applicant appealed to the Controller.

In their assessment of uniformity, the examiners took into account to an important extent the difficulties of identification which they thought might arise, for example, in protecting the breeders' rights against infringement, if an undue lack of uniformity were permitted. This perspective on future possible events was challenged by the applicant. The examiners, he argued, were thinking not in terms of uniformity but directing their thoughts to the issue of stability. The granting authority was not required by the uniformity rule to forecast whether the variety could be maintained true to its description over the period of the rights. Whether a variety is inherently capable of remaining true to its original description over a period of time was, the Controller agreed, an issue for assessment under the stability rule. To attempt to assess and take account of possible enforcement difficulties when applying the uniformity criterion would be somewhat speculative.

The breeder of a distinct and stable cultivar is not required by the bomogeneity rule to achieve an unnecessarily or inappropriately high standard of uniformity in his variety—such standard, for example, as might have for its object the improvement of seed quality. The breeder need not go to excessive lengths over the issue of uniformity. Absolute uniformity is not the standard. The degree of uniformity must not be less than wbat is attainable without excessive effort out of proportion to the improvement in uniformity gained by the removal of offtypes. At the same time, however, the homogeneity rule implies tbat the degree must be such as not to cast in doubt the ability of the variety to satisfy the distinctness and stability criteria.

It is a degree of uniformity which a capable breeder skilled in the art can reasonably be expected to achieve, having regard generally to the nature of plant material and more particularly to the biological possibilities of the species in which he is working, including its mode of reproduction, and to any special features of the variety under consideration. The best test for this is to determine what breeders skilled in the art have achieved and are achieving in the particular species, and to make suitable allowance for any special difficulties arising in the particular varieties.

Against the standard of the skilled breeder, ZEPHYR, as represented by the plant material supplied in 1965, was not sufficiently uniform. One type of variant was present to excess in the grown sample of ZEPHYR, even allowing for some degree of cross-pollination due to the open-flowering habit tbat the applicant bad claimed for his variety.

Criticisms of the Uniformity Criterion

The homogeneity rule does not imply a standard of

[28] FSR 576.

[29] UPOV TG/1/2 says for instance that, for vegetatively propagated and truly self-pollinated varieties, the maximum acceptable number of offtypes (plants which differ in their expression from that of the variety) in samples (sample size being defioed in the test guidelines for the species) of 5 or less (sample size) is zero offtypes, for example, and of 36 to 82 is 2 offtypes. With varieties whicb are not fully self-pollinated (i.e., mainly self-pollinated) the maximum number of offtypes allowed is double that for vegetatively propagated and truly self-pollinated varieties.

total uniformity but seeks only to limit the variations within an applied for variety to an acceptable level. And even if it were attainable, total uniformity would appear undesirable because genetic diversity in a crop can serve as a buffer against disease or environment. Highly uniform crops have been devastated in the past, notably in India in 1974 where the high-yielding pearl millet hybrid was reported as totally lost, resulting in starvation, importation of food grains and depletion of scarce foreign reserves. The old land races cultivated previously were a highly variable lot but relatively low-yielding in comparison with the highly uniform hybrids.

Considerable, though at times uninformed and misinformed, criticism is being leveled at the breeders' rights systems and the seed control systems in developed countries because, the critics allege, these encourage the development of highly uniform varieties and they are intolerant of diversity in a cultivar for largely administrative reasons.

In a slim, highly critical volume under the title *Seeds of the Earth* (published by the International Coalition for Development Action) the author, Mr. Mooney, attacks the breeders' rights system for the disappearance from general cultivation of older, less successful varieties and for the consequent loss of genetic resources which lost cultivars represent.[30] He also accuses plant breeding firms of various malpractices. An official of the United Nations Food and Agriculture Organization, in a not uncharitable remark on Mr. Mooney's views, said at an international symposium on the conservation of genetic resources in 1981 that the book should not be taken seriously because Mr. Mooney directly misquotes so many official reports.[31]

Accepting as we must that any loss of genetic material is a serious matter, wherein lies the cause? With breeders' rights law? Or with the commercial interests of growers and users? We demand uniform crops because they enhance productivity and output. If breeders' rights law went away, arguably food processors and the market would require crops that are uniform in their economic traits.

Plant breeders, every bit as much as their critics, show concern at the possible depletion of genetic material ("genetic erosion") and the vulnerability of modern cultivars. A recent survey from the United States of America evinces that a large majority of plant breeders in five major crops there have broadened the genetic base of their breeding programs since 1970, thereby further reducing the genetic vulnerability of these crops. A majority of the 120 leading plant breeders polled in the survey did not see genetic vulnerability as a current serious problem; and several pointed out that greater genetic diversity does not infallibly prevent epidemics.[32] Gene banks for the conservation of genetic resources have been advocated since at least the early 1960s and as recently as 1980 when the Controller of the U.K. Plant Variety Rights Office, concluding evidence presented to a sub-committee of the U.S. House of Representatives, said that a dynamic plant breeding industry, in both public and private sectors, which sees as essential to its success the maintenance of stocks of genetic material suitable for producing future improved varieties, is one of the best safeguards against the risk of genetic wipe-out.[33]

The fact remains that the old, genetic variable land types do not produce the yields that modern society demands. Arguably, the price for less uniform crops is a fall in world food production from its present, patently inadequate levels. Again, arguably, private capital will not invest its resources in plant breeding unless the administrative and legal means exist for amortizing the investment. If a lesser degree of homogeneity than is presently required for the grant of breeders' rights would lead to enforcement problems, the value of the rights will be that much less.

The Agritechnical Criterion of Stability

The stability rule requires an applied for variety to be stable in its essential characters, that is to say, it must remain true to its description after repeated reproduction or propagation, or where the applicant prescribes a particular cycle of reproduction or multiplication, at the end of each cycle. We saw that a hybrid variety will not come true to varietal description from its own seed.[34] The grower must return to the breeder for fresh seed each time he wants to reproduce the hybrid. If you were to grow the variety from the seeds of an F1 hybrid plant, the resulting F2 crop would be a highly variable population. Plants at F2 would differ from each other—segregate due to rearrangement of the different genetic attributes of the inbred parental types.

Hybrid instability confers biological protection on the variety against piracy.[35] The breeder maintains and

[30] These and other criticisms are also voiced in "The Seeds of Disaster," *New Internationalist*, November 1979.

[31] Williams, J.T., "Gene Banks and Clonal Repositories," a paper read at a symposium on *The Use of Genetic Resources in the Plant Kingdom*, October 15, 1980, and published in *UPOV Newsletter*, No. 25, February 1981; see also Murphy, P., "Plant Breeders' Rights and the Improvement of Plant Varieties," *UPOV Newsletter*, No. 25, February 1981. Copies of all the symposium papers are available (as UPOV Publication 336 (E)/1981) free of charge from UPOV, Geneva (refer to *UPOV Gazette & Newsletter*, No. 27, January 1982).

[32] 214 Science 161, October 9, 1981.

[33] Murphy, P., in *UPOV Newsletter*, No. 23, October 1980, p. 3.

[34] At note 21, *supra*.

[35] The Engholm Committee, note 23 *supra*, para. 248, reported that "the breeder of the hybrid has a monopoly of the supply of the hybrid seed so long as he can keep the identity of the parent varieties secret. In the absence of a protection scheme, there is a strong inducement not to make this information generally available... we think it would be in the public interest if the identity of the parent varieties were not kept secret." If there is no breeders' scheme available, biological protection may be the only means open to the breeder, as in the case of some flower species which are reproduced by seed and for which individually there is a small market (though collectively the market for such species may be very large).

controls the lines or clones needed to reconstitute the variety, together with the know-how on how to effect the necessary cross. Another form of biological protection available to some breeders is cytoplasmic male sterility, where the plant lacks functional pollen.[36] If the hybrid, synthetic or other breeder can protect his variety biologically, what need, you might ask, does he have for breeders' rights? Perhaps if the inbred lines or clones, or the "restorer line" in the case of male sterility protection, are separately protectable, the breeder may see little need for breeders' rights on the end variety. However, breeders' rights on the end variety are apt to provide him with greater protection. Piracy of unprotected lines or clones for constituting an unprotected end variety calls for vigilance by the breeder.

Self-pollinated species like the garden pea, broad beans and French beans fall within a category where stability ought not to be a problem; nor ought clonal cultivars to be problematical as regards stability. Over the years, however, some cultivated clones deteriorate because of diseases, notably viruses. It is said that species of chrysanthemum and dahlia start declining in vigor before ten years have elapsed. A clonal variety or a self-fertilized cultivar can be reproduced easily from a small amount of vegetative material or seed, respectively. Thus they can be copied easily; and that applies to most of the important crop plants, including the main cereals, potatoes, peas, beans, fruit trees, and decoratives like rose and chrysanthemum. This great ease of reproduction, their very fixity or stability, puts the vegetatively propagated and the truly self-pollinated varieties in greatest need of breeders' rights protection.

UPOV TG/1/2, General Introduction to Guidelines, observes that where a sample of the variety proves homogeneous, the variety can also be considered stable. But where there is reason to doubt it, stability must be tested by growing a further generation or new seed stock to verify that it exhibits the same characteristics as those shown by the previous sample of the variety. In *ZEPHYR*, it will be recalled, the applied for variety did not attain the required degree of uniformity and that called into doubt whether the variety was stable. The applicant argued that ZEPHYR was unusually open-flowered and that the segregation found in the grown sample was primarily due to out-pollination rather than residual diversity. If out-pollination was prevented, simply by removing an offtype, the effect casting doubt on the variety's stability would disappear. The Controller conceded the point.

[36] This form of sterility may be found in the onion, leek, beetroot, sweet pepper, carrot, sunflower, tomato, and radish, to name but a few species. Access to the pollen parent is necessary if the female line is to be fertilized for hybrid production. Afterwards, the "male restorer" can be destroyed before it sets viable seed.

The Seed Control Laws

It seems proper, if only because the breeders' rights system and the seed control system are not infrequently confused, to conclude by saying something about the Seed Regulations. These, at least in the United Kingdom, seek to protect the consumer and to enhance the productivity of agriculture and horticulture. In the latter regard, as well as stipulating that a variety intended for the market must be distinct, uniform and stable, the Seed Regulations in the United Kingdom lay down a utility criterion in terms that a plant variety shall, in comparison with other known cultivars, constitute, either generally or as far as production in a specific area is concerned, a clear improvement either as regards crop farming or the use made of harvested crops or of products produced from those crops. The qualities of the plant variety shall for this purpose be taken as a whole and inferiority in respect of certain characters may be offset by other favorable traits. Plant varieties of grasses not intended for use as forage crops and of vegetables are excepted from this cultural significance criterion.

The regulations apply to cereals, potatoes, beet, fodder plants, oleaginous and fibrous plants, and vegetable species (which are intended for agricultural or horticultural production). Decorative varieties and fruit trees and bushes do not come within the Seed Regulations.

The offer, exposure for sale or sale of seed of a variety subject to the regulations but not complying with the agritechnical criteria is an offense under United Kingdom law.

In their role of consumer protection, the regulations enforce the principle: one variety, one name. The position prior to 1973 in the United Kingdom was that many seed firms marketed seed of vegetable cultivars under their own brand name. Thus the same variety of vegetable was often sold in various parts of the country, and indeed even in the same town or shop, under *different* names; in one instance, there were up to 100 names for one and the same variety. It was not unknown either for a firm to sell identical seed under several names. Occasionally, seed of different vegetable varieties was sold under one name. The only effect of these practices was to confuse the consumer, who would possibly be induced by them into paying a higher price for seed that was probably being sold in the same store for a lower price under a different name. So when some critics complain that the Seed Regulations are driving old varieties from the market, they fail to recognize that it is names, not old varieties, which are being forced out under the seed laws.

Conclusion

The breeders' rights system in the United Kingdom works well and in the national interest, even if it has certain defects. Very much the same might no doubt be

said for breeders' rights systems in the other member States of UPOV. Our system is attaining what it was set up basically to do: to enhance productivity in the cultivation of food, fodder, industrial and decorative plants through plant breeding.[37] That can only benefit mankind, which depends, directly or indirectly, on the plant kingdom for almost all of its food. It is easy to forget that. Plants also give mankind clothing and household materials and many drugs.[38] It is not an exaggeration to say that without plants we could not be.

Plant breeding, leading to improved, including better adapted, types, has a major role to play in producing more to meet existing needs and foreseeable demands for food and useful materials.[39] And plant breeders must cater for the new demands implicit in greater leisure time for the bodily well-fed in the advanced economies. Flower and vegetable gardening is a satisfying leisure activity for millions of people. We demand also, on an increasing scale, in those economies, new blooms and exotic plants to enliven our homes and other indoor environments and ornament our leisure parks. If it is to meet these diverse calls upon its resources, the plant breeding industry must invest heavily in what is ordinarily a risky business.

Breeding a new variety is an exacting and lengthy task. A new variety of potato can take up to ten years to breed, a cereal variety as long as 14 years, and a rose variety around seven years, in no case with the certainty of any financial return to the necessary investments.

Lawyers working in the field of intellectual property have a role to play in breeders' rights law. No doubt some plant breeders feel happy that lawyers are very much excluded by their lack of scientific knowledge and their seeming unwillingness to acquire it. Other breeders regret and bemoan the fact that there are few lawyers whom they can turn to when they need specialist legal advice. The remedy lies with the lawyer.

[37] Murphy, P., note 31 *supra*; Byrne, N.J., note 1 *supra*, 4 EIPR 93 (1982).

[38] Riley, R., "Plants That Make Our Society Possible," *Times Higher Education Supplement*, March 25, 1977.

[39] As at note 4 *supra*; Rogers, H., "Crop Improvement by Plant Breeding," *Chemistry & Industry*, July 3, 1976.

Calendar of Meetings

Calendar

WIPO Meetings

(Not all WIPO meetings are listed. Dates are subject to possible change.)

1983

November 21 to 25 (Manila) — Worksbop on Industrial Property Licenses and Tecbnology Transfer Arrangements (in conjunction with the third "Technology for the People" International Trade Fair)

November 28 to December 2 (Geneva) — Permanent Committee on Patent Information (PCPI) — Working Group on Special Questions and Working Group on Planning

December 5 to 7 (Geneva) — Berne Union, Universal Copyright Convention and Rome Convention — Snbcommittees on Cable Distribution of the Executive Committee of the Berne Union, of the Intergovernmental Copyrigbt Committee and of lhe Intergovernmental Committee of the Rome Convention (convened joinlly with ILO and Unesco)

December 8 and 9 (Geneva, ILO Headquarters) — Rome Convention — Intergovernmental Committee (convened jointly with ILO and Unesco)

December 12 to 16 (Geneva) — Berne Union — Executive Committee — Extraordinary Session (sitting together, for the discussion of certain items, with the Intergovernmental Committee of the Universal Copyright Convention)

1984

January 30 to February 3 (Geneva) — International Patent Cooperation (PCT) Union — Assembly (Extraordinary Session)

February 27 to March 24 (Geneva) — Revision of the Paris Convention — Diplomatic Conference

UPOV Meetings

1983

November 7 and 8 (Geneva) — Administrative and Legal Committee
November 9 and 10 (Geneva) — Hearing of International Non-Governmental Organizations

1984

March 15 to 17 (La Minière) — Technical Working Party on Automation and Compnter Programs
June 11 to 15 (Bet Dagan) — Technical Working Party for Vegetables and Snbgroops
June 26 to 29 (Lund) — Technical Working Party for Agricultural Crops and Snbgronps
August 21 to 23 (Hanover) — Technical Working Party for Ornamental Plants and Forest Trees

Other Meetings Concerned with Industrial Property

1983

European Patent Organisation: December 6 to 9 (Munich) — Administrative Council
International Association for the Protection of Industrial Property: November 7 to 9 (Athens) — Council of Presidents

1984

Inter-American Association of Industrial Property: May 16 to 19 (Montreal) — VIII Congress
International Vine and Wine Office: April 9 to 29 (Montpellier) — Séminaire international supérieur de viticulture
Royal Patent and Registration Office: June 13 to 15 (Stockholm) — Symposium on the Centenary of the Swedish Patent System

1986

International Association for the Protection of Industrial Property: June 8 to 13 (London) — XXXIII Congress