COPYRIGHT DIGITIZED: PHILOSOPHICAL IMPACTS AND PRACTICAL IMPLICATIONS FOR INFORMATION EXCHANGE IN DIGITAL NETWORKS*

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I. INTRODUCTION

It is the purpose of this Symposium to "examine the current status and probable evolution of digital technology in all fields of creation and distribution", and, in particular, "its implications for the protection of copyright and the so-called neighboring rights".[1]

It is felt that the challenges of digital technology - the as yet unknown exchange of data it allows, especially in view of the general public being increasingly interconnec-

ted by digital networks - may render it necessary "to consider revision of the existing copyright system", and to re-balance "the scope of rights and the possible limitations on them".[2] This gives rise to a whole set of questions requiring answers, namely whether the existing categories of protected works should be redefined; whether new categories of works would have to be recognized; whether there is a need for the recognition of new rights for the owners of rights in pre-existing protected material; whether the rights of reproduction, of distribution, of broadcasting, and of public communication would require redefinition; whether the present balance of rights and privileges reflected in current copyright laws has been upset and is therefore in need of readjustment.[3]

The foregoing presentations have all focused on the impact of digital technology on the creation, dissemination and protection of works and subjects of neighboring rights within particular fields, such as publishing, scientific research, the music and the film industry. They have concentrated on the possiblities of individual exercise and collective administration of rights, and, finally, on the technical possibilities offered by digital technology in order to control the uses made possible by this very same technology.

The picture thus created is rich in detail and may at times seem rather incoherent. It is therefore recommendable to take a step back and to view the whole scenario from an appropriate distance. This shall be done by way of a a two-step analysis. In a first step, a summary will be undertaken of the ways in which digital technology affects the philosophy behind, and especially the basic notions of, the law of copyright.[4] What will be said here with regard to copyright applies *mutatis mutandis* equally to neighboring rights. In a second step, some of the practical implications of the foregoing considerations shall be outlined and some solutions suggested.[5]

II. PHILOSOPHICAL IMPACT

What then may be distilled as the general impact of digital technology on the philosophy behind, and the basic notions of, the law of copyright? Is digital technology just another quantitative technological leap entailing no further substantive adjustment of existing copyright laws than that provoked by broadcasting, film, sound recordings, copy machines, video recorders, cable nets, direct broadcasting satellites, computer programs and databases?

1. Digitization and Networks

Digitization does not refer to a new work; it is not just an additional medium, nor does it constitute a new manner of using protected material. Digitization in fact means the possibility of converting all sorts of works which are traditionally embodied in different media into a binary representation. These works, no matter whether texts, sounds, images or any kind of data and information, can now be stored in a single medium.[6]

At least in theory, digitization not only opens up the possibility to convert works fixed in all sorts of media to digital form (so-called *digitized works*)[7] and to join them with works which were initially created in digital form (so-called *digital works*).[8] Digitization also enables the storage of all these works on the same carrier, their communication by way of the same communication lines, and, furthermore, free combination and total interchangeability thereof.[9] Authors and producers of digitally stored material may profit from this newly created interchangeability in the same way as users, who may copy, re-use, alter and combine digital material up to the limits of their own imagination.

The effect of this interchangeability is further amplified by the fact that digital signals are distributed and communicated to an increasing extent by *networks*, instead of being stored merely on material carriers. Generally speaking, a network is defined as the linking of - at least - one dispatcher to several receivers. Depending on the structure of the network, receivers may also be able to communicate with each other, and eventually communicate information back to the dispatcher.[10] If a network provides for the latter possibilities, it is said to be *interactive*.[11] A network can consist of any kind of "carrier" capable of transporting information, such as copper and glass fibre cables, but also wireless broadcasting waves. However, due to the scarcity of radio frequencies, apart from traditional broadcasting, Hertzian waves are mainly used in practice for individual point-to-point communication rather than for networking.

As the previous interventions have amply demonstrated, the full potential of digitization and networking just outlined has yet to be exploited.[12] The current situation seems more like an amalgamation of technology distributing analogous or digital signals by a material carrier or transmitting them via networks. The following chart undertakes to position some of the technology currently employed:

	ANALOGOUS	DIGITAL
MATERIAL CARRIER	Videotape Videodisk	CD (music) Photo CD (image) CD-ROM (text; multimedia)
NETWORK (cable and/or broadcast)	Telecopier Analogous picture transmission Digital picture transmission	Online database Digital picture transmission Digital broadcasting

Fig. 1. Present analogous/digital technology using material carrier/networks

The previous interventions also made it clear that consequently both the impact of each technology on copyright law and the copyright problems of the respective forms of signal distribution are far from being uniform. These differences are even further accentuated by several additional factors such as, in particular, the extent to which end user devices are distributed,[13] their storage[14] and transmission capacity,[15] the use for which a particular end user device is designed,[16] and above all, their compatibility. For instance, a music CD cannot run on a computer yet, and text stored on a diskette cannot easily be transferred onto a CD-ROM; likewise, a music CD and a CD-ROM usually still need two different players, and it was only recently that a combined music and picture CD-player was presented.[17] Furthermore, unless encoded, the digital form of digitized material is in general much more accessible to the user when it arrives at the outlet of a network than when stored on a material carrier.[18]

Thus, the practical effect of digital technology on the extent to which protected material is used, may call for immediate legal action in one field (e.g., home copying of digital broadcasting or of on-line material displayed on the user screen), but not so much in another (e.g., copying of remote sensing satellite data). Similarly, the extent to which

new technical devices can be installed to control effectively unauthorized uses of protected material - devices made possible by thevery same digital technology which enables intensified und generally uncontrollable use of protected works - largely depends upon the kind of work used and the actual use made. For instance, there is little risk that image material transmitted in digitized form will be professionally reproduced without authorization, since the reduced data transmitted for selection purposes does not show a resolution high enough in order to obtain a commercially satisfactory print.[19] However, similar devices might be more difficult to install for the protection of textual material, since one cannot just drop two out of three characters in order to prevent the user from copying and re-using the protected text as a whole.

However, certain criteria are common to all the technologies mentioned, and it is these criteria and their effects on copyright law that demand our attention. Of course, this means generalizing to some extent. In addition, existing trends will have to be extrapolated into the future. But in view of the rapid progress of technology this appears to be justified. The future will certainly bring almost, if not complete, accessibility and interchangeability of data, thus allowing all kinds of works, material and factual information, formerly fixed in different media,[20] to be conveyed by all means of dissemination for all kinds of uses.[21]

In essence, it is submitted here that digital technology, even if combined with digital networks, only marginally affects the philosophy behind the law of copyright and neighboring rights as presently drafted. However, digital technology, together with digital networking, does fundamentally affect several of the basic notions employed in order to implement this philosophy in practice.

2. Copyright Notions

Hereafter, some of these consequences shall be outlined. It seems that the repercussions of digital technology and networking will be mostly felt in relation to the concepts

of "work", "author", "public" communication, and finally "reproduction", as far as exploitation rights are concerned.

a) "Work"

The mere fact that digitization allows written works, images and sounds to be combined without limitations, does not in itself pose a problem for the concept of a "work", although this technology extends considerably the possibilities for creative manipulation of existing material.[22]

However, a problem may arise for the following reason. If at the time the work is stored its contours seem to be well defined, a user with free access to the digital form of the material may retrieve whatever part of the initially stored work he selects, and furthermore, not only parts of just one work, but of all the works stored.[23] Thus, the output-units do not necessarily correspond to the input-units. This question as to the "identity" of the work has also surfaced in the context of database protection. Here, it is all but clear what has to be regarded as the "units" of works or material stored, the selection or arrangement of which will determine the originality of a database.[24]

Furthermore, the fact that what was traditionally regarded as a single work may in its digitized form have to be considered a collection of thousands if not millions of single data tends to obscure the distinction between what is protected as a "work" and what must remain unprotected as the mere "information" contained therein. The smaller the units are to which protection will be granted - the smallest unit possible being any combination of data to which a meaning is attached, i.e. arguably a byte -, the more copyright will protect not only a creative work, but mere "information".

Of course, even before the advent of digital technology, any novel could certainly be described as a combination of letters and single characters, and a painting as several millions of picture dots or pixels, but for copyright purposes, this was previously simply

unnecessary. But in a digital context, the question of determining what constitutes a "work" as a point of reference has its bearing on the determination of authorship, on the definition of originality and of exploitation rights, as well as on on the ascertyining partial or complete infringement.

To what extent this erosion and dissolution of the contours of a work will be felt in practice, depends on the degree to which the user will be able - by means of current or future electronic end devices - to access directly the digital code form of the work. Neither a gameboy nor a CD-player permit such direct access, but a computer does; current data bases may only allow access in respect of certain search criteria, but future data base terminals may allow the user unrestricted access to the digital form of the material stored in the data base. Indeed, it seems that the more digital data are transferred not on a material carrier, but via network lines, the more likely will it be that the receiver of such data may gain direct access to them.

b) "Author"

Digital technology and networking will have two main effects on the concept of "author"-ship. The first one results directly from the change in factual access possibilities, the second one is more closely linked to the change in the concept of what constitutes a "work". Interestingly enough, these two effects have opposite tendencies.

First, traditional copyright concentrates on the idea of a single person, or group of single persons, when reference is made to the person who created the work. However, given the facilitated accessibility of pre-existing material in digital format especially via networking, the independent creation of a new work on the sole basis of unprotected ideas and principles will become more and more unlikely. Rather, to an increasing extent, any future creative process would typically start on the basis of pre-existing digital material, adopt parts of it, alter them, and whilst independent variations and maybe some new material were added. This trend will speed up where several authors

work together interactively.[25] In a certain way, the distinction between the author and the user of material becomes blurred, if not obsolete. Therefore, in the not too distant future, there might hardly be any more authors, but a multiplicity of "contributors".[26]

According to traditional copyright principles, these contributions will at best show some originality of their own, and those who have made them will at best have acquired rights in adaptations, if any. It follows that unless the last contributor has contractually acquired the rights that prior contributors may have with regard to the exploitation of the adaptation of their works, the rights in the resulting product will be held jointly by all contributors who have made a protectable contribution. In cases of subsequent contributions which have not been made in common, this result will most likely be unwanted and impractical. Such common ownership may also be prescribed by national law where several persons have interactively made their contributions, but in this context solutions proposed by the traditional rules of joint, common and composite authorship contained in national laws would seem to be more acceptable.

Second, if digital technology and networking thus have a tendency to replace the "author" with mere contributors, the dissolution of what constitutes a "work" as described above[27] seems to work quite to the contrary, i.e. in favor of the contributors' status as authors. The reason for this is the fact that, if single parts of the entirety that was traditionally considered a work - eventually even any combination of data to which a meaning is attached - are regarded as independent "works", it would consequently be possible for independent "authorship" to attach to any of these minimal combinations.

c) "Public" Communication

Traditionally, a work was created within the author's private sphere, in his or her library or studio. Upon publication, the work then left this private sphere and entered the public sphere of the marketplace. There, the first copy of the work was reproduced and/or publicly communicated, before it ultimately entered a private sphere again, namely the

one of the person enjoying the work. Generally speaking, it is the function of copyright to protect the author's both ideal and economic interests in his or her work while this work is in transit through the public sphere.[28] The following diagram is intended as an illustration:

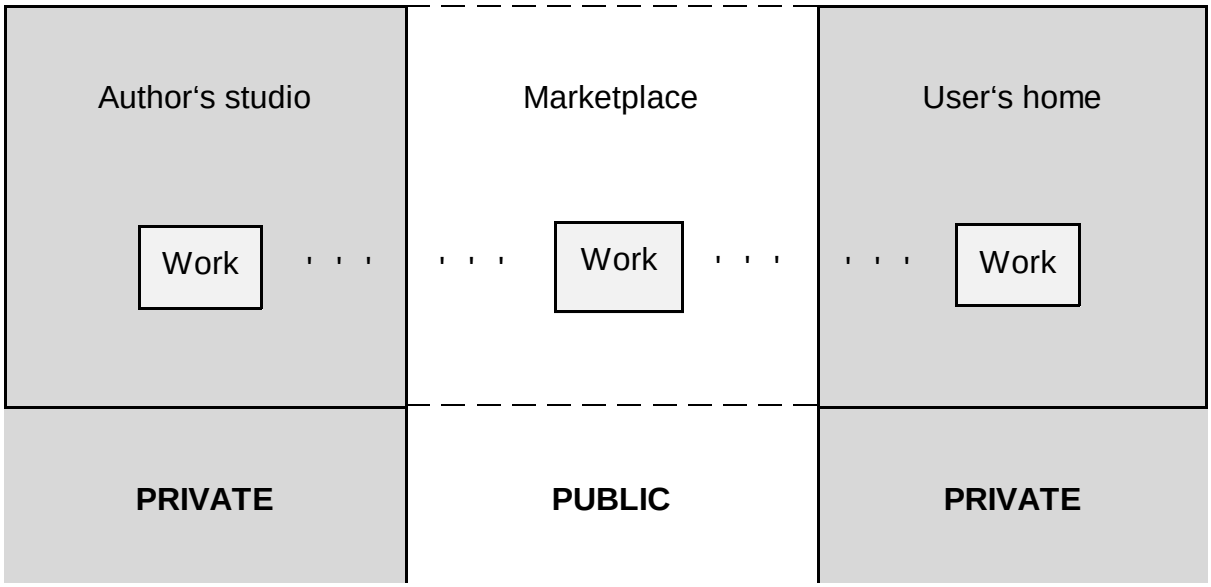

Fig. 2: Transit of the work from private through public to private

How do digital technology and networks affect this background against which copyright was previously applied?

Obviously, digital technology alone doesn't, since a work stored on a material carrier in digital form also travels the route from private via public to private.[29] Rather, the problem caused by digital technology as such is one concerning the ease of reproduction. However, it is the network which brings about the substantive change. It links the private sphere of the author - or of the person or entity offering the work in its marketable form - directly to the private sphere of the person who enjoys or re-uses the work. Thus, the public sphere on which copyright relies to such a great extent is eliminated,[30] and little

more is left than the umbilical cord of the connecting net-line which runs through what used to be the now-eliminated former public sphere. It also follows from the disappearance of the public sphere that any person enjoying or re-using a protected work via a network, reaches from his or her own private sphere directly into the private sphere of the author who makes the protected work available.[31] The picture now looks as follows:

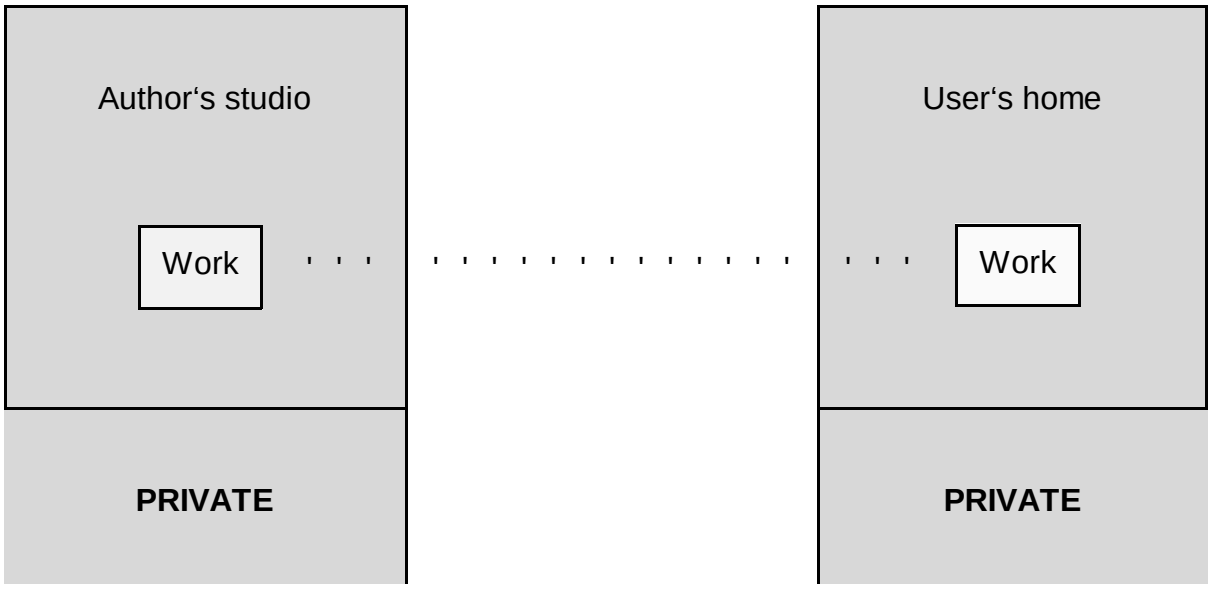

Fig. 3: Elimination of the public sphere:
Transit of the work from private to private

Once it has been understood that networking leads to the elimination of the public sphere, it will immediately be understood why the courts are currently somewhat puzzled by the "public" aspect of new distribution forms such as hotel television, video booths, music played over the telephone, and on-line viewing of protected material by one person only at a given time.[32] Any attempt to still define the relevant public as a group of unrelated people using protected works either in the same "public" place, or at least simultaneously in their respective private homes, must necessarily fail to comprehend the problem.[33]

Therefore, what is needed is an *adjustment of the definition* of what constitutes a "*public*" communication. Furthermore, we are left with the additional legal problem of how to *protect the communication line* adequately against acts of unauthorized tapping. One may understand the netline linking the two private spheres as the "remnant" of the former public sphere, which reaches into both private spheres. Consequently, acts of unauthorized tapping must be prevented even if they take place in the private sphere of the receiving side,[34] e.g. by way of decoding encoded program signals without the consent of the cable service provider. In view of the ongoing implementation of integrated services digital networks (ISDN), the necessity to provide this kind of protection will without doubt increase dramatically within the next few years.

d) "Reproduction" and Use Rights

The main feature of digital technology is that it permits the representation of each protected work in binary code and thus its storage in an electronic memory, irrespective of the medium in which it was primarily realized. Furthermore, networking enables rapid transmission of any work in digital form.

It follows that works which traditionally have been distributed in material copies will be distributed to an increasing extent via networks, i.e. by way of an immaterial distribution of binary signals. This will lead to a growing number of disparities between the two ways of work distribution, since a considerable number of copyright rules only applies to material copies of a work. The recently adopted EC-directive on lending and rental[35] may serve as illustrative example; according to its wording, it only applies to the rental and lending of material copies, but does not apply to the economically similar distribution of - possibly even identical - works via networks. In addition, the current equal treatment of distribution of works in material and in immaterial form, such as the freedom of reading a book and of viewing a work on the screen, may have to be reconsidered.

Furthermore, works in digital form serve increasingly utilitarian purpose rather than those of pure enjoyment or entertainment. Consequently, the dividing line between (private) enjoyment of protected works, which has so far been largely copyright-free, and the (public) commercial re-utilization of protected works subject to copyright becomes more and more blurred. Both purposes presuppose the same restricted acts and in a digital context, they may both be described adequately as appropriation of information. Consequently, digital technology and networking exert considerable pressure to subject acts done in private to an exclusive right enabling the rightsowners to control the fate of their works.

Finally, unless encoded, binary signals may be copied at great speed and at a low cost without any quality loss. This may be compared to similar possibilities of mass-copying opened up some years ago by reprography and photocopying. Yet, technically as well as economically, the process of electrocopying is different from that of photocopying since "it enables the user to store materials and to reproduce them at will, to index them, and (depending on the process used) to adapt them to individual requirements." It therefore "creates a considerable republishing source which must inevitably conflict with the ability of copyright holders to exploit the proper individual value of the works they have produced and invested in."[36]

III. PRACTICAL IMPLICATIONS

1. Solution Methods

The following section will attempt to give some hints as to where to look for answers to the copyright questions raised by digital technology and networking. This shall not be understood as a complete system, and occasionally not even as ready answers. At times, adaptation of existing concepts to new circumstances is attempted, and at times the new circumstances are taken as the starting point for the development of what might

be new concepts. In some instances, a merely modified understanding of an existing concept may lead to the adaptation of current copyright law to the new circumstances.

2. Re-Definition of Copyright Notions

a) "Work"

The blurring of the boundaries of what constitutes a work might not prove very easy to deal with. However, even if it seems that any, even the smallest, entity of digital data might in theory qualify as a "work", in order to qualify the relevant entity of data would have to carry at least some meaning. In practice, the "unit" in which digital data are being commercially marketed may serve as a guideline in order to determine what must be considered a "work" for copyright purposes. So far, originality has been considered the factor which indicates, and at the same time merits, copyright protection. The rationale behind this rule is easy to understand. Only such a person shall acquire rights who has made a substantial contribution. To decide otherwise would indeed mean to create monopoly rights over parts that are too small, which in turn would hinder the creation of larger creations in which society has a clear interest. Consequently, there is no reason why small scale variations of pre-existing works should be encouraged by way of promising an exclusive right for them as a reward. However, digital technology makes smaller "units" marketable than would satisfy the originality crtiterion. Those units would comprise both small investment intensive units and units with little added value which are yet commercially valuable. This aspect will without doubt increase the pressure to protect mere investment and to grant protection to any object that has a commercial value. The newly proposed right against unfair extraction of databases[37] in the EC and protection of single sounds may serve as illustrative examples. In essence, the determination of what shall constitute a "work" for copyright purposes will be a process of weighing the interest in protection against the interest in free accessibility and appropriability.[38]

In addition, when special rules are adopted for certain kinds of works, such as semiconductor integrated circuits, computer programs and databases, the question is which

set of rules are applicable once such works have been stored in digital form? Is the computer tape, on which the data for integrated circuit layout has been stored, to be regarded as a semiconductor chip or as a database? Likewise, it may not always be easy to distinguish between a set of data forming a computer program, and a set of data forming a database.[39] Similarly, whenever material is combined into one marketable multimedia product, it may not always be easy to decide which part should have a legal life of its own and which not.[40]

Finally, in view of the fact that works may be marketed simultaneously in digital/digitized and in non-digital/non-digitized form,[41] any differences in the definition of what constitutes a protectable work, or any other differences in legal treatment caused by the adoption of special rules are in need of specific justification.[42] Otherwise, it would invariably lead to a distortion of competition.

b) "Author"

Works created on the basis of several individual contributions are not actually new apparitions. Apart from the more recent phenomenon of visual art works executed by combining several media,[43] there has been opera and, most notably, film. To the extent in which it was still possible to isolate the different media within the "Gesamtkunstwerk", copyright proceeded from the fiction of co-authored or composite works, and in the case of film exploitation was facilitated either by far-reaching legal presumptions regarding the transfer of exploitation rights, or by the introduction of a straight producer's copyright.

In a digital context, the rules on multiple authorship seem to be an appropriate model whenever several authors create a digital work in common, or whenever several clearly defined works are joined together in order to constitute a single new marketable product. This is the common setting for the development of new multimedia applications. Here, the situation is not very different from the writing of a computer program by several

programers, or the development of a database by domain experts, knowledge engineers and programers. If in some of these instances it may seem questionable whether joint ownership - or the entitlement of each author to individually exercise the rights with regard to his or her own part - will be appropriate in practice, then the exercise of the respective rights can be regulated by way of contract. In addition, this has the advantage of enormous flexibility.

As has been pointed out, the real problem lies where multiple authorship may not be established but only contributions which, according to a traditional point of view, would at best be considered adaptations. Of course, any increase in the number of those holding rights in a certain protected subject matter will ultimately decrease each right-holder's share in the proceeds generated by the exploitation. Furthermore, the larger the number of persons holding rights in one protected subject matter is, the greater the pressure will be to accomodate the exercise of all their exclusive rights in order to provide for relatively unhindered exploitation of the work.

Therefore, should the traditional rule of copyright in adaptations be modified? True, if the center of creative activity shifts in a digital and networking context, as pointed out above,[44] from authorship to adaptation, it would then seem logical to provide for a more sophisticated legal instrumentarium regulating rights in adaptations. But how should copyright in adaptations be modified?

First of all, it should be noted that the problem loses its acuity insofar as smaller than traditional works will also be regarded as copyrightable works in a digital context.

Second, the instrumentarium already provided for in current copyright legislation might come to mind, such as the duty of the owner of the rights in the pre-existing work not to unduly withhold his or her consent to the exploitation of the adaptation, or far-reaching presumptions of transfer of rights. Likewise, especially from an Anglo-American perspective, a producer's copyright would also have to be considered, which would accord any contributor merely the share in the proceeds as contractually agreed upon. However, even a producer's copyright could not secure the producer rights which the

person making a contribution on the basis of the production agreement does not own. An alternative solution appears impossible, because it would in effect override the fundamental principle under almost any national system of coypright law, excluding the bona fide acquisition of an entitlement to copyright. Furthermore, it seems that within the context of digital technology and networking, pre-existing material will often "just be there", and no contract will have been concluded between the owner of the rights in the pre-existing work and any person or producer making subsequent contributions. Absent an agreement, it will be most unfair to "cut off" rights which owners had in their works before an additional contribution was made.

It is imaginable that the exclusive rights of those who have made contributions will have to be reduced from the outset to a mere claim for remuneration, which might then be administered collectively. However, most of these solutions would not seem appropriate under circumstances where a "main" contribution could still be spotted amongst an eventually large number of marginal contributions.

The options do exist, and their number could perhaps be increased by the invention of yet another legal mechanism. However, the central issue of discussion will be to find out which of the solutions should be applied to which constellation of facts in order to reach fair and adequate results.

c) "Public" Communication

It seems that a relatively modest re-definition of what constitutes the term "public" will solve the problems created by the elimination of the public sphere described above.[45]

The direction is indicated by the precedent of broadcasting which may also be understood as a "network", since protected material is sent from private to private, thus skipping the public sphere.[46] The advent of broadcasting indeed posed a major threat to the interests of copyrightholders, and rather quickly, the RBC had been amended at

the Rome Conference in 1928 and article 11bis introduced.[47] According to the solution retained, it is not the effective reception by the general public of the signals emitted which is decisive, but the mere possibility that a public may receive the signals.

Similarly, in the context of a network which eliminates the public sphere, public access to a protected work no longer requires "publication" in the sense that the work be transferred from the private to the public sphere. Rather, from a factual and an economic perspective access only requires that within the private sphere of either the author or the person marketing the work, this work is transferred from an inaccessible (private) part to another (public) part of the private sphere which is open to access for third parties.

In the world of tangible goods, such an area may be compared to the steps outside the front door of a private home, where the empty milk bottles are placed so that the milkman can exchange them against full bottles the next morning. The doorsteps are still on private ground, and yet they are accessible to the milkman.

What is decisive is that, similarly to the house just mentioned, each private sphere connected to a network has two distinct parts: one part which is publicly accessible and another part which is publicly inaccessible. Consequently, a work is being made "publicly" available as soon as it is transferred, within the private sphere of the author - or the person marketing the work -, from the inaccessible part to the part which is accessible to third parties. Such a transfer may be effectuated in two ways. Either a protected work is transferred into a publicly accessible part of the private sphere already existing, or access to such a part is newly opened for third parties. The following diagram may serve as an illustration:

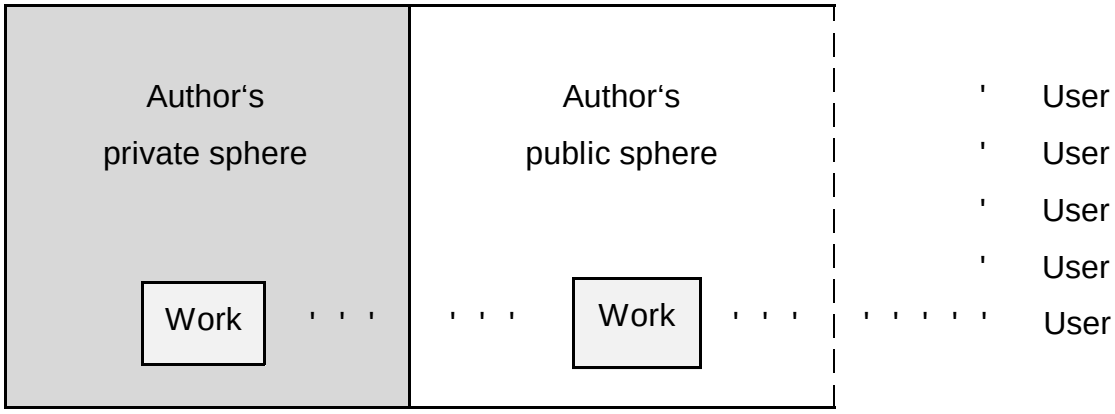

Fig. 4: Communicating a work to the "public"
in a network context

Of course, the work would only have been made "public" if a multiplicity of users does in fact have access, and if the net-line is not merely used for a personal point-to-point communication. Admittedly, in some instances it may not be easy to make this distinction, notably in cases of closed user groups and of transmitting devices which can be used for both private and public communications, such as the telephone, telecopier or electronic mail.[48] But it is claimed here that in order to decide this question, the traditional definitions of what constitutes "public" under national copyright laws could still prove useful.[49] Similarly, a closed user group would have to be regarded as "public", provided decoders have been made available to the general public, or a sufficiently large segment of it, by the rightowner or with his consent.[50]

However, in a network context it may no longer be necessary that each single enjoyment or re-use of protected works takes place in public, or that several people would have to use the work either in the same place or at the same time.

The *protection of the netlines* against unauthorized tapping has two main aspects. First, protection must cover the protected material communicated via the network, and second, the person providing the network service also seems in need of legal protection. Furthermore, it has to be decided whether this protection, beyond covering the act

of tapping alone, should likewise extend to the putting into circulation and to the possession for commercial purposes of any means the sole intended purpose of which is to facilitate the unauthorized removal or circumvention of any technical device which has been applied in order to protect the network against unauthorized access. Increasingly, these problems are dealt with, but apparently individually rather than on the basis of a common theory.[51] Furthermore, it should be noted that where the signals stored and communicated in a network are in digital form, a criminal law protection against informatics fraud punishing illegal access to a dataprocessing system might already exist and eventually apply.[52]

Of course, similarly to the case of the milk bottles placed on the doorstep, which have to be protected against being taken away or emptied by an unauthorized person, protection against unauthorized tapping may be secured by both legal and practical means.

d) "Reproduction" and Use Rights

Hence, how can the right to reproduction and other present use rights be adapted to digital technology and networking?

By now, it seems widely accepted that the *storage* of a work protected by copyright in an electronic memory amounts to a reproduction of the work, and is therefore subject to the consent of its author. This is true irrespective of the fact whether the medium of storage is a ROM, a hard disk, a magnetic tape or a diskette. The fact that a work thus stored may not be directly perceived by a human without the aid of a computer does not contradict this.

In all likelihood, the act of *digitally broadcasting* protected works will already be covered by the broadcasting right of article 11bis RBC as presently drafted, and by national copyright laws. Other than the transmission of programme-carrying signals by wire, digital broadcasting and digital cable distribution do not constitute new means of distribution.

The only difference to traditional broadcasting and cable distribution resides in the different signal representation of the contents transmitted.[53]

However, with regard to reproduction several problems have to be solved at the level of digitization of pre-existing material, the level of internal reproduction, and the output level.

Commencing with the digitization of pre-existing material - such as storing protected material in a database - the reproduction right certainly applies whenever a protected work is stored in its full text version, but it may be questionable to what extent *abstracting* and *indexing* of protected works amounts to a reproduction in a digital context. According to traditional copyright principles, one would have to distinguish whether or not the abstract as such qualifies for copyright protection under national copyright law. If it does, then the reproduction rights have to be acquired for storage from the person who has made the abstract.[54] In contrast, indexing is generally not regarded as a reproduction of the original work, be it in the form of providing bibliographical references, be it in the form of providing key words. However, the question may be posed whether abstracting would not have to be considered a restricted act whenever reading the abstract substitutes reading the original work. This theory is in line with article 9(2) RBC, and has indeed been proposed for adoption into national legislation of the EC-member states.[55] But this circumscription is rather vague and its contours will have to be defined by the courts in each single case.

The greater set of problems concerns acts of use and re-use made of protected material on the digital level and at the output stage. To a certain extent, these problems appear to be interrelated, and most of them have already been discussed since the introduction of copyright protection for computer programs.

A first question is to what extent the merely *temporary storage* of a protected work will amount to an act restricted by copyright. A related question would be whether copyright should cover machine-internal reproduction of protected works not only *in whole* but also *in part*. Two answers seem possible. Either one subjects only those acts of

temporary and partial storage to copyright which, from an economic point of view, indeed open up a new additional possibility to use the protected work, i.e., any storage which allows the work, or substantial portions thereof, to be displayed, printed out or otherwise used;[56] or one subjects any act which technically amounts to a reproduction to copyright.[57] It must not be emphasized that the first approach brings with it considerable uncertainties, whereas the second calls for the introduction of exceptions to the benefit of legitimate users and the public at large.

Second, given the increasing importance of on-line retrieval services (databases, videotext, satellite transmissions), and their extension to the communication of spoken words, music, images and film, it has also been suggested that the act of *viewing* or *displaying* protected material on a screen should be subjected to copyright. This would be in line with the approach of granting to the rightholders the broadest protection possible in a digital context. Furthermore, it would put an end to the present discrimination between document retrieval in material and in immaterial form.[58]

However, it might be doubtful whether it is indeed justified to introduce a display-right *and* adopt a broad definition of "public" communication. If an author has already received his share from the revenue created by the database provider for the use of the database, why, one might ask, should the same author then receive an additional remuneration for the actual use made? In the case of broadcasting, since the act of broadcasting has already been defined as a communication to the public and thus been made subject to copyright, the act of actually viewing the program broadcast is free, and only entails copyright regulation if the signal received is used for a further public communication, such as placing the TV-set in a public place - e.g. a hotel lobby or a bar - or transmitting the signals onto a screen from which the public may perceive them. But in the digital context, the adoption of both a broad reproduction right and of a display right could be justified on several grounds. On the one hand, a display right would be required not so much to enable authors to control the actual display of their protected works, but rather to prevent the user from performing further use acts made possible once a protected work appears on his or her screen (which are, of course, restricted, but in practice can hardly be controlled). In addition, a display-right would

allow the publisher of protected subject matter in electronic form to control unauthorized viewing on the basis of copyright.

Third, however, if such broad protection is adopted which goes as far as to subject normal use acts to copyright, then not only the *mere use* but also *access to the unprotected ideas* and principles underlying the protected form will require the authors' consent. Traditionally, however, the mere use of a protected work, e.g. the reading of a book, was free, as well as access to its underlying ideas. Indeed, the whole philosophy of copyright is based on this fundamental concept.

A fourth problem has to do with *partial taking* at the output level. Once a work is in digital format, any part of what used to be considered the "work" may be easily copied to the extent permitted by the retrieval software.[59] Of course, partial copying is not a new phenomenon. What is new, however, is that from an economic point of view, small parts of a protected work in digital form may become extremely valuable, although they may be far from reaching the level of originality required for copyright protection, or from being substantial enough to be considered a substantial taking. Furthermore, since it is no longer clear what the point of reference is, i.e. what constitutes the "whole" of the work, against which copying of a "part" of it has to be evaluated, it becomes very difficult, if not impossible, to judge the substantiality of the taking.[60] This seems especially true in view of the fact that as regards works in digital form the distinction between the "work" and the "information" it conveys becomes blurred. Must the part of a work initially stored as such, be considered a partial reproduction of the work, or merely the extraction of some of the information it contains? The sampling of single sounds and the corresponding legal controversy may serve as an excellent illustrative example, even if, admittedly, the problem of partial taking does not affect all protected subject matter in the same way.[61]

Finally, on the one hand, the adoption of broad copyright protection invariably leeds to the necessity of drafting *new exceptions to the benefit of legitimate users*. This way was indeed chosen by the EC in adopting the computer program and proposing a database directive.[62] On the other hand, the ease of reproducing electronically stored protected

subject matter may call for the *narrowing down*, if not the *elimination of existing exemptions to the reproduction* right, in order to legislate in conformity with the principle laid down in article 9(2) RBC, according to which an exemption from the reproduction right must not "conflict with a normal exploitation of the work and does not unreasonably prejudice the legitimate interests of the author". Otherwise, the newly opened possibilities of unauthorized appropriation of protected subject matter might themselves lead to a limitation of the "normal exploitation" expectancies under article 9(2) RBC.

This will be especially true with regard to existing exemptions for *personal use*, which under most national copyright laws currently seem to allow for a certain private digital storage of pre-existing works and for private reproduction of digitally stored material. Here it would seem appropriate to subject any private act of storage or reproduction to copyright, with a possible de-minimis exception. Such a solution was indeed already proposed by WIPO as part of a possible future Protocole to the Berne Convention.[63] Exemptions concerning *reproductions made by libraries*, *archives and educational establishments*, and those made for *teaching and research* purposes will also have to be re-examined. Here again, the WIPO-proposals may serve as a basis of discussion for possible solutions,[64] if not with regard to an International Convention, then certainly with regard to national copyright legislation, provided, however, that preference is not given within the framework of "fair use" or "fair dealing".

An additional question would then be how to *administer* effectively these broad reproduction rights. Apart from the question as to which points should be covered by contractual provisions, the major question is to what extent it makes sense to license individually the rights at issue, and to what extent collective administration of the rights would seem more appropriate. The answer to this question will, of course, depend largely on the respective stage at which a party stands in the author-publisher-host-user chain of electronically created and/or distributed copyrighted material. Furthermore, the type of user of copyrighted material will have a bearing on this question. An additional concept to be considered is the possibility of so-called co-operative licensing.

Without going into detail, it may be noted that before a work is published, the author of a work should individually exercise his or her right of first storage against the publisher or any other direct user.

With regard to works published, a distinction would have to be made.

To the extent that storage and reproduction constitutes a primary market, *individual exercise* of the rights will be most appropriate; where defined user groups or corporate users are involved, the form of *co-operative licensing* could appear appropriate, i.e. model contracts or blanket licences may be concluded between the groups of rightholders and users involved.

Collective administration might at first only appear a last resort, where individual control fails. But the positive effect which collective administration can have for each single rightholder, even where a certain degree of individual control is still possible, should not be underestimated. Collective administration would seem appropriate where a great number of unorganized rightsholders and/or users is involved. The prime task for Reproduction Rights Organizations (RROs) would therefore be to administrate collectively the rights with regard to *home-electrocopying*. In this area, it might seem worth considering extending existing systems concerning the collective administration of home-photocopying rights to all sorts of machines capable of electrocopying, such as PCs, readerprinters and telecopiers.[65] In this respect, to be content with what at first looks like a "mere" claim to remuneration, may in the end serve the financial needs of rightholders much better than to hold on at all costs to an uncontrollable and unenforceable exclusive right. Given the generally impossible control of such home-use, the RROs have so far seen "no alternatives, as reward mechanisms to machine/equipment levy systems, or some similar general fee systems not directly related to intensity of use."[66] Furthermore, it is possible that RROs will exercise their classic role of "dealing on behalf of a multiplicity of rightsowners in order to satisfy quickly and easily the *access needs of a multiplicity of users*",[67] to works already published in electronic form with the consent of the authors and publishers. It appears that rightholders and RROs

are on the way to achieving a mutual understanding concerning their respective field of activities.[68]

IV. CONCLUSION

Given the rapid technological development and the relatively early stage of discussion, it would somehow be preposterous to draw ultimate conclusions. However, several factors have already crystalized, and the route which copyright will most likely follow in the age of digital technology and networking becomes more visible the further we proceed.

It should have become clear that neither digital technology nor networking nor a combination thereof mandates a general deviation from the basic copyright principle that authors should participate in the proceeds generated by the exploitation of their protected works. Likewise, the instrument in order to achieve this generally remains the principle of exclusive rights. Of course, as the previous interventions have demonstrated, specific circumstances may call for certain limitations to exercise these rights. Such limitations may take the form of mere claims to remuneration or of collective administration of some of the rights in question. Not only do such limitations re-define the balance of rights and privileges, but they can also serve the interests of both the authors and the public at large.

However, what is called for is an adaptation of several of the existing basic copyright notions, in order to strengthen the authors' and rightholders' control over their works, and secure their fair participation in the proceeds generated by the exploitation thereof. Similarly, these adaptations will have the purpose of avoiding inconsistencies in the legal status of works in both traditional and digital form. Such adaptations would notably concern the exploitation rights of reproduction and public communication. This presentation was intended to define parameters for a possible solution.

Furthermore, the notions of "work" and "author" will have to undergo revision in the near future. As far as they are concerned, the changes to be made will probably be of a more fundamental nature, and it might not be inconceivable that digital technology and networking will ultimately erode the basis of the copyright system. However, in view of the fact that digital interactive multimedia has only just started, some time for further consideration does remain.

Finally, whilst questions of how to administer existing rights appropriately within a digital and networking context will very likely be solved to the satisfaction of the parties involved before long, it will probably prove more difficult to achieve international consensus with regard to the re-definition of these rights and the corresponding exemptions. Indeed, the diversity of the factual situations to be mastered within the context of digital technology and networking seems to necessitate precise and thus necessarily detailed rules, unless the definition of adequate solutions will be reserved to the courts under concepts of fair use or fair dealing. However, so far no general agreement has been reached on this point, and the dispersed national solutions adopted still await harmonization. But is it really surprising that harmonization takes time, especially in view of the fact that a dialogue in the age of digital technology and networking involves an ever growing number of participants?

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1 WIPO International Bureau, WIPO Worldwide Symposium on the Impact of Digital Technology on Copyright and Neighboring Rights, General Information and Provisional Program, Doc. SDT/Inf.1, para. 4.

2 Ibid., para. 3. - See also EC-Commission, Proposal for a Coucil Directive on the legal protection of databases, COM(92) 24 final - SYN 393 of May 13, 1992, para. 3.1.4: "With the possibility of converting all written works, facts, numerical information, images and sounds into a binary representation, the concepts of fixation and reproduction, storage and retrieval of the materials in question have to be re-examined."

3 Ibid., para. 6 (a) - (g). - In addition, the question has been asked as to the impact of digital technology on prevailing contract and licencing terms and practices, and to what extent new contractual provisions could replace detailed new statutory regulation; and, finally, as to what technical possibilities digital technology might offer for effective protection and administration of rights granted, including what kind of legal protection may be required and justified for such technical protection devices; ibid., para. 6 (h) - (k).

4 See below, II.

5 See below, III.

6 Already before the advent of digitization, technological progress had made it possible to transfer works from one medium to another. Music could be fixed in a sound recording, a novel could be turned into a movie, and text, sound, and visual images could be broadcast. However, since all these media worked on the basis of analogous signals and combination was only possible in books, films and broadcasts, neither the media change nor the combination of what used to be different media opened up exploitation possibilities which would have unfairly impaired the rightholders' exploitation interests. Rather, problems were caused by user devices such as video recorders and photocopying machines, which allowed for uncontrollable mass use of analoguous signals.

7 E.g., a book stored on a CD-ROM.

8 E.g., a computer program.

9 For the development of this idea of reducing broadcasting and film, print and publishing, and computers to a unique storage and transmission format, as well as inventing practical applications, see *Brand*, The Media Lab - Inventing the Future at M.I.T., New York 1987, pp. 9 et seq.

10 This largely depends on whether a net has a tree-, or a star-structure, or whether it provides for a back-channel.

11 It should be noted that in current multimedia language, the term "interactive" is sometimes also used for pseudo-interactivity, where the user consulting information stored on a CD-ROM is not limited to predefined question formats, and must not follow a certain predefined path (e.g., CDI ("*CD-I*nteractive", coined as a Philips trademark).

12 An application may be described by its characteristics in terms of "co-operative", "hyper-structure" and "multimedia" (so-called CHM-cube).

13 For copyright purposes, it will be of paramount importance, whether a particular application will be mass-marketed, or whether its distribution will be limited to professional high-end equipment. To cite an example, while there has been a tremendous increase in the market penetration of PC's, CD-ROM-drives are still not installed on a mass basis, although the first laptop with a built-in CD-ROM-drive has already been presented.

Furthermore, it should be kept in mind that the extent to which certain user devices are distributed or on-line services used may vary considerably from one country to another. For instance, Germany still lags far behind the U.S.A. and the U.K. in terms of database users; in contrast, or perhaps even in reaction to this, the CD-ROM market has picked up just some time ago.

14 Standard PC's, widely distributed with no more than 20 or 40 MB hard disk capacity are hardly sufficient to copy or exchange huge amounts of data. In comparison: an HD-diskette stores 1,44 MB; a hard disk between 20 and 120 MB or more; a CD-ROM 600 MB. If text is stored in an uncompressed form, 1 MB represents roughly 500 pages. A PC can therefore store between 10.000 and 60.000, a CD-ROM up to 325.000 pages of text (generally, however, additional storage space has to be reserved for the retrieval software). High resolution scanning of a single 24 x 36 mm slide produces 18 MB; when compressed by 4:1, slightly over 100 pictures may be stored on a CD-ROM. In order to achieve high resoultion video, the MPEG (Motion Picture Expert Group) standard has been set at around 190:1.

15 Currently, signal transmission by mass-marketed modems works at a speed of up to 9200 baud; the transmission rate of N-ISDN is 64 kbps, and of B-ISDN 2 Mbps. Other European networks allow for up to 140 Mbps.

16 Although both the telephone and the telecopier use the telephone lines and transmit analogous signals, their actual use poses quite different copyright problems. Also, similar to the old Swiss "Telephonrundspruch", which transmitted music performances via telephone, some actual uses made may become obsolete over time.

17 Kodak Photo CD Player PCD 860.

18 But note also the difference in accessability of music stored on a CD, and text stored on a CD-ROM.

19 Even with software restoring defective sets of data, it will generally not be possible to restore the amount of detail lost by the reduction process.

20 Hence the term "multimedia", whereas the term "unimedia" already emphazises digital storage as the common medium, rather than reflecting and thus holding on to outdated media distinctions.

21 Currently, are deemed "multimedia" the combination of different static and dynamic media used for the presentation of information; "hypertext" non-sequential text organized in a network-like structure; and "hypermedia" multimedia components organized in a network-like structure whereby the various parts within the system can be accessed interactively throughout the system.

22 For the creative and artistic implications of such a "combined data space" and the connecting "highways of the mind" (the "streets of the immaterial data and picture traffic"), see *Claus*, Elektronisches Gestalten in Kunst und Design, Hamburg 1991, pp. 66 et seq.

23 To cite just one example: If James Joyce's "Ulysses" were stored in digital form, a user could retrieve it as a book; but the user could likewise retrieve single pages or single words, or ask how many times James Joyce placed a colon in front of the word "metempsychosis".

24 See article 2(3) of the proposed EC-directive on the legal protection of databases, O.J. No. C 156 of June 23, 1992, pp. 4 et seq.

25 Professionals have already coined a new word for this interactive co-production. In the modern language of English abbreviations they have labelled it "CSCW", standing for "computer-supported co-operative work"; see *Claus*, op. cit., p. 71.

26 This creative scenario must not be confused with the one discussed under the heading of computer-assisted, computer-produced and/or computer-created works. There, the question is whether, and if so under what circumstances and in what ways, authorship attaches to works which have been created with the aid of a computer, i.e. with the aid of computer tools, and to what extent authorship in the tools continues in the works created by or with the assistance of the tools; see, WIPO (ed.), QUestions Concerning a Possible Protocole to the Berne Convention, Copyright 1992, 30 et seq., paras. 50 et seq., and Report of the Committee of Experts, ibid., paras. 100 et seq. In the present context, however, the question is to what extent authorship of a pre-existing work - which has possibly been modified with the aid of a computer tool - continues to subsist in the modified work.

27 See II.2.a.

28 The divulgation right protects an author against the transfer of the work from the private into the public sphere against his or her will; the paternity right guarantees that the bond between the author and the work appears in public; and the integrity right protects the author against any modification of the work which would be prejudicial to his honor or reputation, and which thus presupposes that the modification be perceived by the public. It follows that what has to be considered the public sphere for copyright purposes may also include publicly accessible places on private premises. Furthermore, the exploitation right to publicly communicate the work applies by definition with regard to the public sphere only. Finally, the fact that from an early stage in the development of copyright reproduction was reserved to the author even if made within the private sphere, does not necessarily contradict the finding that copyright generally protects works while in transit through the public sphere. Rather, this may be seen as protection against acts which by creating a further copy of the work open an additional possibility of enjoyment, thus having an effect in the public sphere (either such a copy is brought back onto the marketplace, or it removes a potential transfer of an authorized copy from the marketplace).

29 Furthermore, it is of no importance whether the work in question was initially created in analogous (printed book stored on CD-ROM) or in digital form (computer program stored on a diskette or in a ROM). See also above, figure 1.

30 This model goes back primarily to the theories of post-modern philosophers trying to describe the information society; see, e.g., *Flusser*, Design Report, No. 17, July 1991, p. 30 et seq., also on the political consequences of the "home as a central point in the network of personal relationships".

31 Generally speaking, the conclusion has been drawn that the eleminitation of the former one public sphere has now led to several public spheres, or, in other words, that each private sphere is at the same time - at least in part - also public, and that any of these public spheres are likewise private. Finally, it follows that from an economic point of view what used to be the "public" must now be described as the aggregate of single private spheres.

32 The following cases may be cited as illustrative exemples: Austrian Supreme Court of June 17, 1986, GRUR Int. 1986, 728 (hotel video as public performance), and of January 27, 1987, GRUR Int. 1987, 609 (video booths as public performance); French Court of Appeal of January 10, 1992, RIDA 153 (hotel-tv no public performance). In the USA see, e.g., *Columbia Pictures Industries, Inc. v. Redd Horne, Inc.*, 749 F.2d 154 (3d Cir. 1984) (video booths public performance).

33 Furthermore, such decisions tend to be inconsistent with each other. To cite just two examples: in Germany, the Federal Supreme Court (BGH) held - admittedly in an earlier decision - that the transmission of radio signals from one central receiver to independent loud-

speakers in separate hotel rooms would have to be looked at as an act outside of the scope of copyright; BGH, BGHZ 36, 171. However, there is little doubt that the transmission of signals received by a central antenna to television sets in a larger number of hotel rooms would constitute an act subject to copyright. See also, e.g., *Columbia Pictures, Inc. v. Professional Real Estate Investors, Inc.*, 866 F.2d 278 (9th Cir. 1989) (lending videodiscs for playing in hotel rooms no public performance).

Likewise, in France the showing of television broadcasts in hotel lobbies and hallways will have to be considered an act of public communication subject to copyright, whereas the making available of the same television broadcast to the same clients in their hotel rooms will not.

34 I.e., the public part of the private sphere of the signal receiver; for this incorporation of the "public" into the private see above, note 31, and below, III.2.c.

35 EC Directive (92/100/EEC) of November 19, 1992 on rental right and lending right and on certain rights related to copyright in the field of intellectual property, O.J. No. L 364 of November 27, 1992, pp. 61 et seq.

36 The U.K. Publishers Association (ed.), Electro-Copying and Infringement of Copyright, of 23 January 1992, p.1.

37 Article 1(2) and 2(5) of the proposed directive, op. cit.

38 See also the definition of "insabstantial part" of a database, the taking of which does not infringe the right against unfair extraction, article 1(3).

39 See the French case decided by the Cour de cassation, April 16, 1991, Droit de l'informatique 1991, No. 4, p. 33 (data included in drawing modules regarded as a computer program).

40 E.g., under the proposed EC-directive on the legal protection of databases, op. cit., a "database" shall comprise "the electronic material necessary for the operation of the database", whereas any computer program "used in the making or the operation of the database" shall be governed exclusively by the EC directive on the legal protection of computer programs, O.J. No. L 122 of May 17, 1991, pp. 42 et seq. (article 1 (1)). Doubts have been voiced on how to apply such a distinction to the system for obtaining or presenting information, and it has been questioned on what grounds it might be justified to treat some of the database components as not having their own legal life, even if they were possibly made by a third party on the basis of considerable investment.

41 Such as, e.g., encyclopedias which come in paper form as well as on a CD-ROM.

42 E.g., when limiting the scope of the proposed EC-directive on the legal protection of databases to electronic databases, the EC-Commission came to the conclusion that this would not unduly prejudice against collections in a traditional form, notably on paper (recital 19; for the reasoning see COM(92) 24 final - SYN 393 of May 13, 1992, paras. 3.1.4 et seq., especially 3.1.10 and 3.1.11).

43 Such as collages and performances. Since about the 1940s, works characterized by the combining or the merging of two or more traditional media have been called "intermedia"; for their historic development see, e.g., *Frank*, Intermedia, Die Verschmelzung der Künste, Bern 1987, pp. 6 et seq.

44 See II.2.b.

45 See II.2.c.

46 See above, II.1.

47 At the Brussels Conference in 1948, article 11bis was amended to cover cable retransmission as well.

48 In most cases, all these devices mentioned are used to replace an oral or textual private-to-private communication, but at the same time they may be used for public communication, such as music played over the telephone to anyone calling or put on hold, advertising via telecopiers or electronic mail.

49 Eventually, national definitions are in need of being amended slightly in order to allow for the accessability by several people under circumstances where, seen from an economic point of view, no enjoyment or re-use of the work takes places. However, this is not a particular problem of networks; rather it appears whenever there is in-house, intra-company or distribution of protected works within other closed user-groups.

50 See, e.g., the definition of "communication to the public" in the case of direct satellite broadcasting as proposed in Art. 1(b) of an EC directive on satellite broadcasting and cable retransmission, O.J. No. C 255 of October 1, 1991, pp. 3 et seq. (Art. 1(1)(b) of the amended proposal, Doc. COM(92) 526 final - SYN 358).

51 See, e.g., Art. 7(1)(c) of the EC computer program directive, op. cit., from which this formulation was borrowed. See also Sec. 298 (2) of the UK Copyright, Designs and Patents Act 1988, and regarding its interpretation House of Lords of June 6, 1991, (1991) 3 W.L.R. 1.

52 See, e.g., 18 U.S.C. § 2515(1)(b), Federal Wiretap Law; § 202a of the German Criminal Code (covering both electronically as well as magnetically stored data), and Art. 462-2 et seq. of the French Code pénal, introduced by Law No. 88-19 of January 5, 1988, as well as the recent introduction of new articles 79-1 to 79-6 of Law No. 86-1067 concerning the freedom of communication (sanction against unauthorized fabrication, importation, offering, sale, posession and advertising of satellite signal decoding devices).

53 However, it is yet another question whether or not, according to national principles of how copyright contracts have to be interpreted, digital broadcasting will be covered by a grant of the traditional broadcasting right.

54 This may be the author of the original text, or an employee or a person commissioned by the person undertaking the storage.

55 Art. 4(1) of the EC-proposal for a directive on the legal protection of databases, op. cit.

56 See for computer programs, e.g., German Federal Supeme Court of October 4, 1990, 22 IIC 723 (1991).

57 This approach was taken in article 4(a) of the EC directive on the legal protection of computer programs, op. cit.

58 Such a right of "indirect" display - as opposed to "direct" display, especially of works of the plastic and graphic arts - was proposed by WIPO in its draft of a possible Protocol to the Berne Convention; see *WIPO* (ed.), Memorandum, Copyright 1992, 66 et seq., paras. 109 et seq., especially 112. The discussion amongst the experts showed that so far, there is no agreement as to whether or not such a display of protected works on a computer screen already amounts to an - albeit temporary - reproduction; see Report of the Committee of Experts, Copyright 1992, 93 et seq., paras. 87 et seq.

Article 4(a) of the EC-directive on computer programs, op. cit., for the first time explicitly subjects the "temporary reproduction" of a program in part or in whole to copyright, and therefore also the "displaying" of a program on the screen. Similarly, the article 5(e) of the proposed EC-directive

on the legal protection of databases, op. cit. grants the author of a database the exclusive right to "display ... the database to the public".

59 For this disintegration of the copyrightable "work" see above, II.2.a.

60 An definition attempt in this direction concerning partial taking of a database with regard to the newly created right against unfair extraction has been undertaken by the EC-proposal for a directive on the legal protection of databases, op. cit. According to its article 1 (3) "insubstantial part" shall mean "parts of a database whose reproduction, evaluated quantitatively *and* qualitatively in relation to the database from which they are copied, can be considered not to prejudice the exclusive rights of the maker of that database to exploit the database" (emphasis added).

61 Whereas partial taking is quite a problem regarding textual material in digital format, computer programs are mainly concerned as regards interface information or single program modules, but hardly single lines or even signs of code.

62 See articles 5 and 6 of the EC directive on the legal protection of computer programs, op. cit., and articles 6 - 8 of the proposed EC directive on the legal protection of databases, op. cit.

63 *WIPO* Copyright 1992, 66 et seq., paras. 72 et seq. For discussion by the expert committee see Copyright 1992, 93 et seq., paras. 48 et seq. - A similar rule affecting computer programs only was contained in § 53(4) sentence 2 of the German Copyright Act, before it had to be modified following the harmonization process of the EC-directive.

64 See Copyright 1992, 66 et seq., paras. 76 et seq., and for discussion, see Copyright 1992, 93 et seq., paras. 48 et seq.

65 Yet, it is questionable whether the proceeds thus generated would in fact compensate adequately for the losses incurred by mass-electrocopying. Similarly, a levy on storage media such as diskettes - comparable to the levy on videocassettes - would hardly seem possible. On the one hand, the sum to be collected in order to compensate for the loss of all protected material copied on to a diskette would by far exceed the sales price of a single diskette; on the other hand, contrary to a levy on videotapes, a levy on diskettes would somehow lack justification, since only some of the diskettes sold are actually used for copying copyrighted material, whereas the rest is used for storing the user's own material.

66 Report of the IFRRO Working Group 1989, p. 7.

67 Ibid., p. 11.

68 See IFRRO/STM Joint Statement on Electronic Storage of STM Material, Helsinki, September 24, 1992.