We are delighted to include the following article on the subject of the Internet from Professor David Crystal, who visited Poland in May 1998 to give a series of lectures as part of the British Council's 60th anniversary celebration programme. This paper is an edited version of a lecture originally delivered to the Arts Council in Wales (November 1996). We hope you will agree it has a wide relevance to teacher education.

To surf or not to surf: that *is* the question

DAVID CRYSTAL

Last month I was in Vienna, attending a symposium celebrating 50 years of the British Council's presence in Austria. The British Council office there is probably the most famous in the world, at least in cinematic form, for it was in its lecture room that Holly Martins, in *The Third Man*, gave his famously inept lecture, and got himself into trouble as he continued his search for Harry Lime. The lectures last month were, by contrast, highly competent, and the nearest I got to Harry Lime was on the Third Man tour, which actually takes film buffs to the locations still standing (including a visit to the sewers). The lecturers were members of the International Association of Teachers of English as a Foreign Language (IATEFL), and they dealt with a wide range of themes; but by far the most popular discussion point, both inside and outside the lecture room, was the role of the Internet, and how it would affect the teaching profession. The mood was positive. Indeed, in the Association's August newsletter, there is an article on why teachers should welcome the Internet with open arms, and the editor highlights as a heading the view of the writer Anthea Tillyer: 'No-one who surfs the Internet will come away unawed, bored, or claiming that it was not worth the effort'.

Let us cut now to the *International Herald Tribune*, which in September 1996 ran a short piece by another writer (Andrew Glass) on the same topic. Here the mood is very different, and the headline reads: 'Please, Will Somebody Make the Internet Work?'. This is what Glass has to say: 'Scarcely a day goes by without my having to fight through unexplainable glitches, software mismatches, and crippling stoppages', and he concludes, 'More and more we find the Internet slowing to a crawl or just plain giving out on us. That's because too much data is being pumped into too-narrow pipelines. Today's clogged arteries ... are a sure sign that drastic steps are needed to prevent a cataclysmic Internet collapse'. And there are other mournful voices. Paul Vallely, in *The Tablet* (2 March 1996) heads his article 'To the Devil with the Internet', and quotes Arthur C. Clarke, who was the first to dream of telecommunication satellites 50 years ago, as wanting to unplug himself from the network, because 'there's too much information pollution'. Joining the Net is like 'drinking from Niagara Falls. The flow just doesn't stop'.

These voices are typical: they each represent a body of opinion, one wildly enthusiastic and optimistic, the other sober and pessimistic. Who should we believe? And, faced with the option to travel along the superhighway, should we go boldly, reluctantly, or not at all? To surf, or not to surf? That is the favourite metaphor of the moment – though if Andrew Glass is correct, 'to snail' would be a more appropriate one. This is indeed the question for all of us. Is the expenditure of

time and effort (in learning the new technology) and money (in purchasing the necessary equipment, maintaining it, and developing our use of it) worthwhile? Would it not be better, perhaps, to 'bear those ills we have / Than fly to others that we know not of?'

First of all, let us be clear about the nature of the enterprise – which is truly one of 'great pith and moment'. We are, after all, talking about a potential technological revolution of unprecedented scope, the aim of which is to enable people all over the world to communicate with each other in seconds, and to have direct and immediate access to all conceivable kinds of information – aims which have been dramatically identified by the metaphors of the 'electronic global village' and the 'information superhighway'. But it did not start out this way. The origins of the Internet were local and (relatively) modest: they are to be found in the USA in the late 1960s, when a system called ARPANET, the Advanced Research Projects Agency Network, was devised as a decentralized national network. Its aim was to link important American academic and government institutions in a way which would survive local damage in the event of a Third World War. It thus had very limited aims and scope: it was an inward-looking defence capability. No-one thought of it at the time in terms of overseas use, and its potential for other purposes was unrecognized. But in the 1980s the service was opened up to private and commercial organizations, and it is since then, and especially in the past five years, that the notion has become a popular reality. It has been doubling in size every twelve months, and today probably has about 50 million users.

When we talk of 'popular reality', in this context, we need to bear in mind what kind of reality this is. We are not talking about a physical existence, a central body located somewhere in the world with 'Internet' over its front door. The Internet – or 'Net' for short – is no more and no less than a vast group of interconnected computers. It has no central point, or hierarchy. And if you want to be part of this network, in touch with all these computers, then you need only to make a connection via an Internet Service Provider (ISP). There are over 100 ISP's in the UK alone. They are, in effect wholesalers, offering you a tiny piece of their huge network of connections; but they are the only way in which you can get access to the Internet, so service provision is a highly competitive business. Once you have selected your service provider, and paid your dues, you receive a software communications package, which you load into your computer, and an electronic address, which is a location within your service provider's computer. You are then part of the Internet yourself. To get in touch with any other Internet computer, all you need to do is dial the number of your service provider, and choose which Internet service you want. You are then 'on-line'.

The notion of 'service', in the singular, is somewhat misleading. In fact, there are three types of service available.

• The one most people are familiar with is electronic-mail (e-mail), which allows you to send a private message to anyone in the world who also has an e-mail address. Delivery is virtually immediate, like a fax: but, unlike a fax, you can send the same message simultaneously to any number of people by simply asking for a copy to be sent to their address.

• Second, there is the newsgroup system, which allows large numbers of people to communicate with each other in real time. There are now over 20,000 discussion groups or chat rooms on the Internet dealing with every conceivable topic, from politics to pornography (to take just two which regularly hit the headlines), and in over 100 languages – though some 80% of Internet communication is currently in English. When you join a newsgroup, you access a central computer (called a server) where you can read what everyone else has been saying, and to which you send your own contributions. This is the area which has received a great deal of attention recently, with people

debating whether the total freedom of expression on the Internet ought not to be constrained through some degree of censorship. Internet law (dealing with such matters as libel, copyright and obscenity) is a rapidly developing specialism.

• Third, there is the World Wide Web, the combined information resources of all the computer locations (sites) which have made their data available – and this will be the focus of this paper. Devised in 1991, Web sites range from the huge (such as the Library of Congress catalogue, or the *Encyclopedia Britannica*) to the minute (such as the single page which any of us might put on the Internet to tell the rest of the world about what we do). Note the phrasing: the electronic world evidently cannot do without the terminology of the book. A Web 'page' is rather like the page of a magazine, in fact. It can contain text and graphics, but unlike a magazine page it can (with appropriate software) use sound, animation, and small video clips. The data on a Web page might be educational (e.g. an encyclopedia), commercial (e.g. an advertisement for a product or charity), general reference (e.g. newspapers), or entertainment (e.g. a computer game). It may be a large organization, such as the British Council, or a small one, such as the arts organization with which I myself am connected, the Ucheldre Centre in Holyhead. Each has its (sometimes lengthy) electronic address. The good news is that, once you have typed an address into your electronic address book, it takes only a single keystroke to activate it. Familiarity breeds content.

No-one knows just how large the Web is. There is no single catalogue of everything. If you know the Web address of a particular information source, then you can go to it directly. If you do not, then you have no alternative but to 'browse', using one of the companies which have devised ways of searching through the mass of material, such as Netscape Navigator or Microsoft Explorer. For example, I recently wanted to find out what was on the Net on orchestras. I called up Netscape, and chose one of the 'search engines' (Lycos), typed in the word *orchestra*, and within a few seconds the system had scanned over 68 million documents and found 12,324 documents which made use of the term.

This example immediately illustrates the strengths and weaknesses of the Web. Let us deal with the weaknesses first. To browse through 12,000 documents sounds like a strength, but I doubt whether anyone has that kind of time. This is the information overload which Arthur C. Clarke was talking about. It is almost like entering the section of a well-stocked library which has shelf after shelf on orchestras, with the difference that I cannot see all the books at once, the titles of the documents are often much less clear than book titles, and I must call up each item separately from its electronic source (I cannot take three items 'off the shelf' simultaneously). Calling up an item currently takes a lot of time, for the speed of transmission is relatively slow, and the time it takes to 'download' a document depends on what it contains. If it contains a lot of fancy graphics, colour illustrations, and so on, it will take much longer than if it has only text. The technology of rapid transmission is available in theory. Bill Gates, the head of Microsoft and acknowledged digerati guru, has referred to fibre optic technology which would allow, for example, the whole of the *Encyclopedia Britannica* to be sent from A to B in less than one second. But in practice, most of us have to deal with relatively slow modems and telephone lines.

Another weakness is that the information you find on the Web, although impressive in its range, is by no means systematic or comprehensive. Putting it in a nutshell: whether you find information about a particular orchestra depends entirely on whether there is someone in the orchestra's administration who has bothered to set up a home page for that orchestra. There are some orchestras in the world who obviously have a computer buff in their ranks. Thus I was able to find out every member of the BBC Symphony Orchestra; I saw a picture of the whole Cleveland Orchestra; and

I was told the entire history of the Newfoundland Symphony Youth Orchestra. On the other hand, I couldn't find a home page for the Halle Orchestra at all.

Then again, is the information up to date? Putting your page on the Web is not a once-and-for-all activity. You have to update it at regular intervals. The page for the Liverpool Philharmonic tells me what their forthcoming concerts are, obviously that needs to be changed as time goes by. It is a discipline which Web users have to learn. If they do not, their page will become increasingly out-of-date – and there is nothing more frustrating than spending time calling up a Web page to find that it is useless.

Moreover, there is no way in advance of distinguishing between relevant and irrelevant, between quality and rubbish. Because the Web is so democratic, anyone can put information onto it – most service providers offer you a certain amount of free space – and it is up to the user to sort it all out. Even a word like *orchestra* can generate some irrelevant search results: one of the documents in my search was headed *Indiana Jones and the Last Crusade* – simply because the text refers to the use of an orchestra in the making of the soundtrack. But my best example is the search I carried out some time ago for information on the country Bermuda. I found several dozen documents, but the first few were all advertisements for *Bermuda shorts*! Moreover they were ads for a company representing different months of trading – in other words, the first one was, say, for December 1994, the second for January 1995, and so on. Evidently the trader has not replaced his first page by later pages. He has left the earlier pages on the Net. Some people think that over half the pages on the Net are out-of-date versions of things, which people have forgotten or not bothered to erase – but they all have the same status as the up-to-date material when you carry out your search. Everything looks equal. The biggest risk of the Internet is that it buries you in trivia.

Another advertising ploy takes advantage of the way most search engines work. They usually list the items they find in terms of relevance. For instance, if you are looking for *orchestra*, an item about the Toronto Symphony Orchestra is going to be more relevant than a short story about rabbits which just happens to use the word *orchestra* in its opening paragraph. Search engines can handle this kind of thing in various ways, but they are usually statistically based. In other words, they look for the frequency with which a keyword is used in the first few lines of text in a document: the more instances of it they find, the more that document will rank high in the list of 'hits'. Advertisers know this; I have seen an ad for a particular product in which the name was printed out 30 or 40 times at the head of the document, to ensure it shows up quickly. This is 'adverma-tion'.

Finally, by way of weaknesses, there is the need to phrase the terms of your search as carefully as possible – otherwise you will be flooded with useless information. The problem is, you cannot anticipate all the ambiguities in your question in advance. Trying to find out the length of the Ambassador Bridge in the USA, I typed in the two words *ambassador* and *bridge* – a specification which I thought would be as straightforward as it is possible to imagine. But the first documents my search threw up were all to do with *Star Trek*. Why? Because there are many *Star Trek* enthusiasts on the Internet now, and all the scripts are summarized there – and several evidently involve alien ambassadors arriving on the bridge of the starship *Enterprise*! Of course, in principle such problems can be weeded out by good quality content-category indexing – but the level of indexing on the Internet at the moment is very poor indeed. There is no single system – how could there be with so many millions of pages built up over several years? – and what there is remains at a very general level. Fortunately, more specific methods of interrogation are now beginning to be available, such as the aptly named *Cyberhound*. Artificial intelligence techniques are being devised to

produce 'intelligent agents' – expert systems which will search Network documents for you, while you are off-line, distinguishing different meanings of a word, and disregarding irrelevant items. But all of this is in its infancy.

These are some of the difficulties you encounter in using the Internet. Let's look now at some of the strengths. You can have some marvellous hits. Recently I wanted to find some information about the fantasy writer, Clive Barker (of Candyman and Hellraiser cult fame). There was no mention of him in any of the dozens of encyclopedias and reference books I have available. But a search for him on the Net brought me to his home page within a few seconds, and there was a potted biography with a list of all his major books. It also gave me an electronic address where I could contact him, if I wanted more. Another example: a colleague of mine, writing a reference book, wanted to find out whether a certain media personality was dead. He put the request out in a discussion group, and got a dozen replies stating that the personality was very much alive – including one from the personality himself!

This is where the Net wins, and you bless it. It provides you with an answer to a specific question within seconds – and one which, previously, would have required a visit to a public library or some other lengthy mechanism of search. Also, the more you use the Net, the more you build up experience of avoiding the false trails. When you find a good source of information, you can keep a note of where it is – the procedure is called (once again, following hallowed literary tradition) 'bookmarking' – so that the next time you can go to it directly.

Navigating the Net is also made easier through the use of links between pages: using your mouse to click on a textual or graphical 'button' will automatically transfer you to related information which someone has previously identified as of potential relevance. Pages can be linked in this way even if they are on different computers in widely different locations. It's up to the page originator to decide what the links are, of course, and the system is by no means being used to its full potential; but it is possible to find sites which send you from one topic to another in intriguing ways – for example, a page on Italy might lead you to Florence and thus to a museum and from there to a school of painting, and from there to an individual artist, and so on. It is this ability to jump about from site to site which led to the metaphor of surfing.

A particular benefit for organizations which are using the Internet is that you don't have to have all your personnel in one place. For example, the booking office for an organization can be anywhere. If you are short of space in your building, people can be working from home or elsewhere. There can be considerable savings in overheads. Large businesses now do this kind of thing all the time. Swissair has moved its book-keeping department to Delhi. One of the US airlines processes all its tickets in Bombay.

There is also the considerable feedback which Net users can provide. Unlike postal questionnaires or person-in-the-street interviews, a Net query can produce instant responses from thousands. Net users are apparently prepared to spend huge amounts of time responding to other Net users. When the Pope sent out his 1995 Christmas message on the Internet, he received 307,786 replies within just 48 hours – without even asking! On the other hand, you have to be prepared to accept the consequences of successful marketing. Someone has to read all these replies, and decide what to do with them. Do you reply in turn? And remember that not all the replies you receive will be worth reading. The other day I called up my e-mail box, and was told there was a new message waiting. I accessed the message, and it was from someone I had mailed the day before, from whom there was no need for a reply. The message said simply, 'OK'.

While on this point, do be prepared to encounter new kinds of dialogue when you use the Net for the first time. In group discussions, the screen conversations can look quite bizarre, as, if you make a point, you might find several people responding to it at different times, and with different delays, while the rest of the conversation has moved on. Also, although there is an Internet etiquette, remember that most people involved in Net dialogues are anonymous, and their points can be made forcefully. If someone does not like what you are saying, they will tell you so, in no uncertain terms. There are also many eccentrics and crazies out there, who send bizarre and obscene messages for fun. And remember security, for there are an unknown number who take pleasure from hacking into your files or corrupting them by sending a computer virus. For anyone linked to the Net, a procedure of installing virus protection and making a daily backup of one's database is essential.

Marketing surveys are also beginning to produce results: who uses the Net? What age range, sex, and occupation? This kind of information can be helpful to organizations wanting to target a campaign. For instance, in the UK, Internet usage is heavily skewed towards professionals, directors and managers. It seems that most Net users read the quality rather than the tabloid press. There is a strong male bias – various surveys show that female users are only 20–30% of all Net users. And the average age – disturbingly for most of us – is 28.

However, for most users information retrieval is the true strength of the electronic medium. This has always been the weakness of the book. It has been said with considerable truth that the value of a reference book depends on its index. But even the best of indexes displays the limitations of the printed medium, as one works through a list of page references and hunts on the page for the relevant place, with fingers in several places at once. An electronic search, by contrast, is so much easier, especially when the item being searched for is highlighted. The search can be so much wider than any single book, or set of books, can provide. And it is so much quicker. Remember the days when it took ages to get a number from telephone directory enquiries? And now an enquiry about a number in Vladivostok doesn't take much longer than one about a number in Brynsiencyn in Wales. Nowadays databases are being compiled in which, for example, every road in the world is identified, or every postcode in the world. Books are not the medium for that kind of message.

It is also possible to ask fresh questions, using the potential of the new medium. For example, some encyclopedias and dictionaries are now accessible on the Net (some free, some through a subscription). The software varies a great deal, in terms of what it permits you to do, but in principle it is now a straightforward matter to find all the people born in, say, Paris, who became artists – and if you want to refine your search, who lived in the 18th century, and who were women, and whose first name was Marie – all in a few seconds. That kind of research enquiry simply could not have been sensibly progressed using traditional materials.

On the other hand, the electronic medium is not good at presenting information. The screen has its physical limitations, allowing only so much to be seen at a time – rarely more than about 80 characters wide and 30 lines deep. To see more you have to scroll sideways or vertically, and this poses immediate problems of perception and recall. It simply is not easy to follow complex layouts on the screen. Also, certain kinds of information – easily reproduced typographically on the page – cannot be well presented on the screen. For example, many kinds of accents, needed for foreign languages, are not available in the character sets which most machines rely on.

Nor is the computer the best kind of machine to handle the sort of procedure we all use when we are working on a project. In preparing this paper, for example, my computer was surrounded with

scraps of paper, source articles, personal notes, and the like. I knew where everything was, and rearranged everything to suit the needs of the writing moment. It was a mess, but a professional, creative mess. In principle, it would be possible for all these sources of information to be present on screen in a series of adjacent or overlapping windows – but anyone who has used a windows approach to organize information knows how quickly one loses track of where one is after only three or four windows are simultaneously present. The world of paper is best for some activities, and you can't beat the book for flipping backwards and forwards, or for handling data of variable size and density. Nor can you beat it for taking on a long journey (the battery of your laptop will give up after 3 hours or so). And certainly not for taking into the bath, or to bed. Books are comfortably tactile. Books don't need a power supply, and don't put you at risk of an electromagnetically-induced headache. The concept of snuggling up with a good computer is one which is still remote. (Though there is a *Punch* cartoon which shows a little child in bed in front of a computer screen, and the mother at a terminal downstairs, typing in the story of the three little pigs.)

It is interesting, also, to note the way that the new huge databases complement rather than replace the world of the book. AND, a Dutch firm which specializes in database compilation, has a database of the European road and rail network. If you are an international transport firm, and you want to organize your 500 lorries so that they take the best routes across Europe from anywhere to anywhere, the AND software can work it out for you, pointing out where the petrol stations are, where the laybys are, and even where traffic jams are likely to be. They can do the same thing for your family holiday too. You can buy a route from them, say from Holyhead to Naples, for just three or four pounds, containing all the information you need about the route, and including hotels, tourist attractions, museums etc. They will send it to you neatly packaged – but significantly, as a single booklet, not on a disk.

Other media present complementary alternatives too. It will be possible one day to call up any film over the Net, in much the same way as video makes it possible to take a film home now. But, as has often been noted in relation to video, there are losses in the practice. The home video experience does not in any way replace the theatrical experience of finding oneself part of the large-group response – whether laughter, applause, or the proverbial intake of breath – which can be found in the cinema. I shall never forget the delight which made a whole cinema audience applaud when the stratagem at the end of the film *The Sting* was finally revealed. All of us have had similar experiences, as we attend concert or play, or participate in an exhibition opening. This is something which the one-to-one world of the Internet can never replace – the emphatic buzz which comes from inhabiting the real arts world.

All the arts cry out for a response that is much fuller and more dynamic than anything the virtual world can provide – a response that is immediate, sharable, multi-directional, and multi-dimensional (visual, tactile, and especially verbal). If the aim of the arts is to move us, then we are not usually satisfied to be moved in silence and alone. We find ourselves saying things to everyone around us, like 'What did you think of that, then?' or 'Wasn't that great!'. And in general, if you reflect on your last successful dinner-party, get-together, or pub-crawl, it seems that we cannot do without this kind of lively multi-way interaction, where people interrupt and anticipate each other, repeatedly try to make their point, nod or shake their head furiously while someone else is talking, tap each other on the arm, and provide ongoing verbal feedback (*mhm*, *absolutely*, *bravo*). What a contrast with the world of the Net, where everyone takes their turn, messages come in obediently one after the other, and people cannot (because the circuitry will not let them) talk at once. What a semiotically sanitized medium it is! There is no rapport through

touching, there is no counterpoint of facial expression and gesture – the world of 'body language'. Also missing is the proxemic value of distance (such as when someone stands too close to you for your comfort, or someone doesn't stand near enough) because in an electronic world everyone is at the same virtual distance from everyone else. In short, there is nothing on the Net like the bubbling of a successful, multi-way conversation, where each of the participants comes away having enjoyed the rapport – of being part of the experience. 'Ooh, I did enjoy that chat', someone might say (even though they don't clearly remember anything at all about what was said). No electronic interaction will ever be able to replace that notion of what 'talking' is all about.

Every time a new communication technology comes along, people worry about the death of the earlier ones. The printing press was condemned as the machine of the devil by the Vatican in the 15th century. People thought film would displace novels. They thought TV would displace film. And now they think the Internet will displace TV. In a recent survey, 36% of respondents surfed the Web daily in preference to watching TV. Personally, I am doubtful whether any scenario of doom is likely. History shows us that each technology has brought fresh strengths and weaknesses. And I believe the information superhighway will eventually take its place alongside traditional media, and will not replace them. Moreover, remember that we are not at the end of the technological road: there are other technologies still to come. In a couple of generations, for example, the typewriter-bound nature of the present medium will be gone, and we will have speech synthesis and speech recognition available to us. It will be interesting to see what happens then, and whether some of my semiotic problems can be overcome.

In particular, people worry greatly about the possible social isolation which the Internet might bring, but this, I think, is to confuse the medium with the message. The former Archbishop of York, Dr John Habgood, announced he was logging off, and commented: 'My nightmare society is a lot of self-centred individuals concerned only with their own fulfilment, sitting all day in front of their computer or television screens, and soaking their minds in increasingly violent and obscene entertainment'. At a local, social level, the prospect of being able to do all one's shopping via the Net fills some people with horror. Will there be an age, they ask, when people will no longer need to learn how to relate to others, face-to-face, and thus will be unable to do so when the opportunity arises? This is to open up this paper's topic in other directions. Personally, I don't think these dangers are real – but I have to say I was impressed by a recent episode of a popular TV comedy series when one character develops a relationship via e-mail with a girl-friend, and they arrange to meet for dinner. When they do, they find they cannot communicate at all – until, near the end of the meal, they both pull out their laptop computers, and carry on an animated conversation through their screens!

A version of this paper was originally presented as a lecture given in honour of Sir Ben Bowen Thomas, who once described himself as:

> ..... the ordinary man: the fellow who brushes up his ego by keeping in touch with greatness; the eavesdropper on the insights and discoveries of experts; the listener to lectures and addresses – braving the element of risk involved and the dire consequences – all because of an innocent and sincere respect for the heritage of his people and a humble desire to make as much as possible of it one's own.

The ordinary man, the brusher-up of egos, the eavesdropper, the desire to make knowledge one's own. I don't think I have ever found a better informal characterization of an Internet user!