

## Computers, Education and Architecture for the Lost Profession.

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### Abstract

*Those who build are gradually, at the moment, subverting the traditional role of the architect. Architecture needs new ways of expressing itself. Architects need new ways of being architects. There are less and less jobs, and those there are are less and less to do with Architecture. In this essay, I am concerned to confront the question of what computers<sup>0</sup> mean for education and professionalism (especially in architecture), and, thus, for us as architects and teachers of computing. The argument is centred in architecture, but its conclusions are, I believe, also more generally tenable.*

### Background

We live in a world and a society (seen through the particular warp of our European eyes), in which our most important characteristic or quality is taken to be not who we are, but what we do: particularly what we do by means of work. On meeting people, we ask what their job is. When we become unemployed, we feel awful, and society holds such a negative view that we have to legislate to equalise the employed and the unemployed, and the so-called opportunities that we made for the unemployed. Our value in life is our job, and our job is valued in bizarre ways. It is no wonder the unemployed feel low self-esteem and depressed. In psychotherapy, the first thing to build, always, is our own valuing of and belief in our selves. If we cannot learn to feel good in and of our selves, we cannot beat depression and misery.

It is often asserted that computers are major culprits, replacing human beings and thus destroying jobs. While I remain sceptical about the causal link that is usually quoted, I propose to go along with this perception, for reasons that will become apparent. Anyhow, in many respects this is a case where the perception is what matters. Thus, computers are (in part, at least) held responsible for the lack of jobs and hence our employment—and therefore the low self-esteem and depression felt by so many of those who have not that paramount quality by which they can be known: a job.

A further associated difficulty is that, if we do not have a job, we find ourselves disabled in that we feel (often rightly) that we are unable do anything: we can affect nothing, we can effect nothing: we do not have the facilities and resources. It is, most would, I think, agree, difficult to be an effective architect without there being jobs for us to do and buildings for us to build. For most, architecture cannot be done without building, and it is difficult to build without having a job (and commissions).

At the same time, education ("leading out", from the Latin) is being replaced in our universities by training. In my differentiation, education is concerned with helping the individual find out

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<sup>0</sup> In which term I include all of Information Technology and everything else that is relevant!

who he/she is, and what they might do (thus becoming effective actors, to rephrase management cybernetician Stafford Beer): training is fitting individuals to particular tasks by forming them to those tasks (and is, thus, the antithesis of education). In the United Kingdom, the government's policy in increasing<sup>0</sup> the number of places for students in universities seems (according to Ministerial quotes) to be to train them for industry. The evidence is both their own explicit statements, and the level of reduction of resources that makes education—rather than training—inconceivable and impossible, plus their blatant lack of concern for individual human values.

(Of course, to train people for particular jobs, nowadays, is itself ludicrous. The nature of what is involved in almost all jobs changes so fast that trainees are trained to be (unmodifiably) square pegs for holes that have, since their training began, become round. What is needed is the skill of adapting in changing circumstances and specifications, so that, as the shape of the—metaphorical—hole changes, we can accommodate. This skill is referred to as "Learning to Learn". But we live in a short-term workaholic culture in which greed and ambition are outstandingly acceptable, and the reflective value of an activity such as learning to learn, or even learning in itself, is little valued.)

At the same time, the professions are types of (high grade, well thought of) jobs. But the professions are under attack. The attack comes from at least two quarters.

Firstly, it comes from the threat of those who work in associated but less prestigious fields. These people, I believe, feel excluded from the inner mysteries of each (professional) field, and not without reason. Architects, for instance, generally keep the secrets of architecture from their under-educated colleagues, eg the architectural technicians. The resulting envy has led to a serious attempt to usurp the fields of the professions by those who have been excluded from understanding precisely what the profession is engaged in. (In the UK we have many examples: for instance, Prince Charles' outbursts against the elitist and exclusory jargon (ie, language) of architects; the number of applicants for places in architecture schools who admit they are there to satisfy the cravings of their engineer or contractor parents.)

Thus, in the UK, there have been serious attempts recently to attach the appellation "architect" to all those involved in the building process, as if it had no meaning (that is, no quality) in itself, and as if building were synonymous with architecture. The political and financial power of the large construction companies (who, like the Road Transport Lobby, contribute generously to the Conservative Party's coffers) has added to the downscaling of the architect's contribution and involvement—never that large, in terms of construction projects realised—so that, in many instances, the architect is brought in merely to perform a cosmetic function.

Thus, or professional jobs are being taken over by others, who are (by definition) not party to what is particular to these professions. The builder now, more than ever, designs the building, inviting us architects to help obtaining planning permission for their money amplifying schemes by using our skills as facade decorators and navigators of the planning regulations (and the fact that planners often tend to believe architects have the taste that builders do not).

Secondly, it comes from the computer in the form, in particular, of Expert Systems and the like. It is possible to build models of professional experts' expertise that allow their (explicit/logical) decision making procedures to become apparent and to be installed on computers. Databases which are navigated by question and answer have become very successful since the first, Eliza, was created. In some fields, such as psychiatric counselling and diagnosis of sexual infections, these programs are far more popular than a personal diagnostic meeting.

But the author of Eliza has spent his time since her formation campaigning against his creation. One of the arguments against Eliza and her offspring is that professionals do not carry out work in the mode the production line/factory worker model determine. The professional is one who

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<sup>0</sup> I am not arguing against increasing the availability of university education. I am arguing against making it available when it has been asset stripped and pretending that what is on offer is the same as what was on offer before it was asset stripped; and I am against pretending the "top" 5% is the same—or should be the same—as the next 5%; or that we should see universities as providers of training or satisfying external criteria in guaranteeing "fitness". In fact, in the UK, the universities are used as a way of reducing the number appearing on lists of the unemployed.

evaluates and advises on the taking of risk and decisions, usually in "muddy" areas, on behalf and for the benefit of others. His/her primary function is not to be right, but to be honest (hence those professional codes of conduct): to help where there is complexity and contradiction, and lack of clarity. Professionals make their best, untainted judgements on behalf of their clients and advise us, who consult them, accordingly. (It is thus nonsensical to sue a doctor for a wrong diagnosis, because we have not bought a right one from him, merely his honest best advice.)

Nevertheless, the professions are jobs, professionals are known and valued by their jobs and by their jobs being professional jobs; and their jobs are decreasing and likely to continue to decrease at a time when more and more students are being released from universities, trained for jobs in these same professions—jobs that are not there.

We are in a mess. We are "educating" more and more people. What for? Not for what education gives us, a sense of being who we are, and of the worth of being who we are! There are more people looking for less jobs (the fallacy of "qualification"). We encourage the numbers of those looking for particular jobs to increase. We reduce the fitness of those looking for these jobs by training them to be square pegs for holes that are constantly changing shape. We emphasise the valuation of people as being their jobs: and hence, in a job based culture, we increase low self-esteem and depression amongst a large section of the (western) population<sup>0</sup>.

Is this ever likely to change? This is a determination for an economist or, perhaps, a social historian. However, the trends say no. The increase in computers says no. And the experience of my younger friends says no<sup>0</sup>. I do not think it is likely that there will be more full-time work in the current first-world in the foreseeable future.

Assuming the trend, then, what can we do to counteract the loss of our professions, low self-esteem and depression? This is what I shall consider in the rest of this essay.

## The Situation

We start from the understanding:

- 1) We value ourselves for our jobs (and we should not do so).
- 2) The number of jobs, especially those that match our "qualifications", is decreasing
- 3) Computers are implicated in the loss of (the number of) jobs.

## The Understandings

The first of these points is familiar from therapy. I will not, therefore, spend long on it. It is covered universally in the literature, and is only peripherally my field of competence. However,

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<sup>0</sup> And amongst many of those employed, who are working in such an uncivilised manner that they have little time to be human.

<sup>0</sup> Amongst the younger professionals I know (aged between 30 and 40), few have reliably plotted out careers as their parents would have had. My many Dutch friends, for instance, have never had regular and continuing jobs, and do not ever expect to. They all work in short-term, freelance positions.

the general point can be simply made. In order to recover in the case of any psychological or emotional malaise, we have to attend to our own self-esteem, image, and valuation. What is primary in our ability to live well, to operate within the world we know and to be content, is that we feel good about ourselves and our interactions: that we are happy being who we are and being in the relationship we are in with the world, gladly accepting our responsibility for being who and where we are.

Behind this need is the notion that we give ourselves a low value. In fact, many of us hardly value ourselves at all: valuing ourselves for our job we become dysfunctional, and, losing it (or fearing losing it), we risk becoming ever more dysfunctional.

It is easy enough to state the obvious "solution" to this "problem": we should stop valuing ourselves for the job we hold and start valuing ourselves for who we are (growing to become more the people we would like to be). But, as with all such solutions, there are difficulties. The first, and obvious one, is that no improvement can occur as the result of the operation of the obligatory "should". Improvement comes from within, cannot be injected by others, and is exactly what becomes, in the original Catch 22, more and more hard the further our self-esteem falls. How to reverse this is the area of psychotherapy and its associated fields.

Let us assume, notwithstanding, that we can and do arrive at some point where we begin to wish to care for ourselves. Then we have another problem to deal with. What can we use to support us in our endeavour?

It is here that the computer can make a very special contribution. For, while it may or may not lead to a loss in the number of jobs available to an ever increasing body of humanity, it also provides us with ways of finding out who we are, becoming more who we wish to be, even working within whatever field we may choose without resource, facility or commission (in the case of architects) other than computers<sup>0</sup>.

What, then can the computer can give us?

In the first instance, it offers us a mirror. Eliza is just that. Some would claim that a mirror is all that a computer is, and it is certainly true that, whatever what we (human computer operators) may take to be, eg, a picture, the computer may take to be something completely other: and we cannot know what<sup>0</sup>. We make our sense of the computer screen (as it is at the moment). All we know about the sense that the computer may or may not be making of it is that it is not a picture, as we would understand it. But, then, it is not our job to be in its image, or its to be in ours. We can only see it within our own interpretation (this is the cleverness of Alan Turing's rebuttal of Lady Lovelace's argument about Artificial Intelligence). The computer, and our relationship with it, may be the ultimately explicit assertion of what, in philosophy, has come to be called the Constructivist Position<sup>0</sup>. As a mirror, it can show us ourselves as we cannot see ourselves, whether it is intentionally distorting or not. Thus, the computer offers us a means to discover more who we are, to reflect upon our reflexion.

The computer also provides access to extraordinary amounts of what we (insensitively) call information. (Insensitively, because information is formed into meaning by us, and is not in form when the computer presents it to us: the meaning is in us, not in the screen). Hyperbolically speaking, we can access almost anything about almost anything. Although the search and filter technology we have at our disposal today is really very crude (and the solutions proposed are

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<sup>0</sup> There will be those who object that computers are expensive. The usual answer, the "trickle down theory", seems to me to be an unsubstantiated excuse that removes a perfectly valid question from the arena of matters to be attended to by a low-grade sleight of hand. My answer is that I believe that computers are essentially incredibly cheap and should be distributed free, like other prosthetics (remember, the current organisation of the market just increases real prices of goods by staggering amounts: the cost to the manufacturer of what we buy is typically less than 5% of the cost we pay). Computers (of the so-called "personal" type) should be as free as the air we breathe! I will not argue the point here, but I hope at least this can be seen to be a better answer, in terms of both the first and the third worlds.

<sup>0</sup> This acceptance that we cannot know is one of the most valuable insights of Constructivism.

<sup>0</sup> The constructivist position, to be properly presented, requires the use of very careful—and often very convoluted—language. I shall not attempt this, here, but will rely on the sympathetic, sensitive and intelligent interpretation of the reader.

still both very primitive and limiting in mitigating to reduce surprise—see later), and although the process is deadeningly unreliable, slow and learningless, we can access cosmological quantities of information in a vast number of fields. And, at least for the moment, we can access the authors and experts, personally, too, with the instant chumminess and passing generosity and good-will that is so typical of the (US) American frontier tradition. The world of what we believe we know, for instance, and of the traces of our endeavour (eg books) are available as never before. Further, of course, we have discovered that the means by which we access all this stuff, the computer connected through the InterNET, has become a medium which provokes new responses, new knowings and new traces of our endeavours. In this respect, computers are participating with us in the generation of novelty and in the redefining of knowledge (existing regardless of the knower) into knowing (in which the knower is involved). They enhance our creativity and extend the range of our endeavours.

In providing access to authors and experts, the computer makes us another special offering: connection. We need not be alone any more. If contemporary society is alienating, as has been argued so often and so convincingly, if we have lost the social cohesion of pre-industrial life and, with that, all too often both the opportunity and our ability to meet-and-mix, computers, at least the InterNET—especially with the currently developing technologies of the InterNET telephone and video conferencing, and the gradual development of multi-sensory output—offers us a new chance to meet in a new way<sup>0</sup>. Connection, of course, means interaction (in a way that so-called computer interaction—truthfully action and reaction—has not yet got near): and interaction is at the basis of our being, not only socially, but as cognisant individuals. Herein lies the possibility of conversation—with other humans (either facilitated or mediated by computer), or eventually with a machine itself. The medium of computing offers as yet unguessable forms for and ways of connecting. Who knows or cares, under these circumstances, what the reality if any of (eg) InterNET cybersex will be<sup>0</sup>—that is a question of the simulation of old ways of connecting, not an offering of new.

These three gifts, themselves, create new opportunities. For instance, the availability of information means that distance learning is, de facto, a fact. We don't have to plan for it, it is here. What we have to do is to find how to facilitate it, and how to increase quality in terms of learning and the experience we go through in learning (which may well not simulate current learning support devices such as the tutorial). Connection means that communities of learners may develop and may provide some of the support provided, in our education systems, by the tutorials and other such-like events. And, of course, other sorts of support leading to entirely new, unpredictable outcomes.

Thus, research can take on a much more radically novel meaning than is accepted in the research (equals publication) environment we currently condone. And a PhD might become the aspiration of anyone who can dream of such a thing. Indeed, study may well be a great leisure activity (but

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<sup>0</sup> Evidence that such a need is real can be found in the many sorts of contact clubs etc that exist.

<sup>0</sup> Although, since sex is now divorced from reproduction and, reciprocally, reproduction is divorced as in "Fahrenheit 451" from sex, it is reasonable to ask what sex will become: a performance art, a la Jeff Koons and La Ciccolina, or any (live) sex show?

what is leisure and what is not, when the primacy of the job is no longer?). Learning may become a group activity, so that studying for a PhD may be carried out in connection with and with support from a group of others via computer. Human beings may truly be thought of, as machines for learning as the cybernetician and CAL innovator Gordon Pask insists: for even the laziest of us learns all the time, even if only a little and somewhat unambitiously: we learn to stay alive. Computers (may) make learning, as an activity, more available and attractive. Studying may become the explicit way of life of many.

Education is concerned with helping the individual find out who he/she is, and what they might do. Thus, this gift of gifts provides the opportunity for us to redress the damage that a lack of jobs is taken to be doing to many of us, and what is often demonised as the primary cause, may, after all, be seen as that which bears the gift of potential recovery.

(Yes, the idea of a world populated by people who wish to learn is idealistic and optimistic. I would argue it is, nevertheless, achievable. I would also argue—but not here—that a contemporary understanding of communication indicates that our "nature" is to be generous and altruistic, in contrast to the causalist simplification of the mechanist pseudo-scientists who argue the essence of selfishness, and whose doctrine so powerfully reflects prevailing and essentially pessimistic political views.)

There are other gifts, also, perhaps secondary gifts of gifts, the computer offers us. There is no doubt that the computer has deskilled many jobs (for instance, typesetting). This is a great loss. The upside is that it has made (eg) the skills of the typesetter available to everyone. Of course, this is not quite true, for the skill of the typesetter is not just in laying the letters, but in learning the etiquette of page design: a skill that most of us designing page layouts so lack that it leads to dreadful results. (This failing is, of course, "curable" through education and through the development of resident computer "experts" within the computer itself.) The point, however, where the gift becomes meaningful, is that where it would have been impossible before the computer for us to try to gain many skills, this is now possible. More than ever, we are limited by our imagination and desire.

Equally, computers are capable of presenting to us the familiar in an unfamiliar form, thereby giving it new relevance: as does a good teacher, or a story-teller, for instance. One of the most interesting examples is the way that 3D urban models are beginning to be used not just for visualisation, but as rich databases (their designers currently, and quite understandably, claim that all computer files are databases), full of statistics and stories, bringing the city to life and casting new light on it allowing us to see it differently. With the abstract nature of computer information (viz it is digital), we also have files that are completely general, and which may be interpreted in a multiplicity of senses/media. Visually generated files may become sound sculptures (as with the earliest electronic music instruments). This ability gives us new patterns and insights—and may thus help us understand ourselves: how we see the world (and how we organise it); and, when the subject is explicitly and literally ourselves, who we are. Here, reflecting, we reflect upon our reflexion.

So we increase potential richness and variety (in which increase a source of creativity may be found). Those of us who have worked in the architect's studio know it is as place where theft—the theft of ideas—is licensed (as it should be, for we do not own the ideas we have, nor do we know where they come from). That is, the studio (as do other similar environments, eg the seminar) works because it encourages "borrowing" and extending the ideas of others within the studio. When we take ideas from others, we increase the variety available to ourselves, just as we borrow and re-form the ideas of others in a conversation. The mechanisms of the studio and of conversation allow us to transcend the limitations of our own understandings. They allow ideas to "brew", to develop in the interaction space between us. Computers can often perform and support this function. They allow us to increase the variety of concepts, ideas and understandings that are available to us or which we may develop, through connection to others and the availability of massive amounts of information<sup>0</sup>, as well as through the generation of understandings deriving from reflecting on reflexion and "distortion" and re-presentation in a

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<sup>0</sup> Especially the information that does not entirely match what we are looking for, and hence transcends the limitations of our own understandings.

modified or new form. In a word, computers encourage surprise.

The last area I should like to mention is "Reality Modelling"<sup>0</sup>. With computers, it is easy to model reality in ways impossible before the advent of this device, wondrous at abstracted number crunching. It is possible, for instance, to analyse structures that it was inconceivable to analyse before, and to represent the results of analysis in quite amazing ways. Simulation has become so proficient that we often believe we are in a particular reality when we are not (thus inviting questions about when we are in reality and what reality means). Extending this, we can "model" realities humans have never been in, whether those realities are of other planets or of travelling through our own blood vessels; or of worlds of different continuities than those consensual and conceptual realities we have grown up in; or of worlds of the imagination—from adventure games to the shapes of mathematics<sup>0</sup>. We currently call this ability to simulate and model Virtual Reality.

When we can model (at least in principle) most of what we might like, when the possibilities that modelling gives us can encourage flights of fantasy we had not even dreamt of, we are in a radically new conceptual world. Previously, an awesome responsibility fell upon us as architects: we had no possibility of trying out and testing our ideas. Our models were crude as models, if delightful as objects. We confused "models for" with "models of". But it was too expensive to build actual models, and the "real" objects we made were too final and too expensive to be treated as tests. And so on. The risks of hurting people in one way or another were awesome and the responsibility fearful. Now, we are on the verge of being able to so model anything that comes to our mind (including the context, that is the "universe" within which we make our models), that we can test our notions seriously before making them—or even not make them at all<sup>0</sup>. We are on the point of being able to model whatever we like (the human body, for instance), and carry out operations (in the medical case, quite literally) as if it were there, and carry out tests that work like real. But we can also cast the universes in which these models exist much as we wish, modelling the universes themselves. Thanks to the computer.

Thus, computers may help us to find ourselves. They allow us to reflect on our reflexions, to reform information, to connect with others and converse, to enlarge our range (ie, our variety) and hence our creative potential (contrary to popular opinion). They may help us learn competence in the greater range of skills that they now make available to us (thus opening up all areas including the professions so that, while the man in the street may trespass into areas of the professionals, themselves, may venture further into the unknown). They can help us to develop ourselves as learners, and as formers of the world. They can help us fill in the time that hangs so heavily (what a dreadful concept!) with the unemployed, to generate better (and more positive) understandings of ourselves, hence improving our self-esteem. They can give us connections with others, or with their selves acting as others. They allow us to test ideas with confidence, in detail and with a

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<sup>0</sup> I hope the reason for the use of the (constructivist use of) inverted commas will become apparent: it will not be elaborated.

<sup>0</sup> William Bricken, the theorist behind the early days of the "Human Interface Technology" Lab in Seattle, liked to remark that Virtual Reality was of no interest when it imitated "Real" Reality.

<sup>0</sup> I am reminded of this most forcefully as I sit at the mobile office I now take with me like the clothes I wear, far from home in the city where the quarter-scale model of Brunel's Clifton Suspension Bridge is to be found.

thoroughness previously beyond the dreamable. They allow us, in becoming more creative, also to create more and with less fear, for, in simulating the virtually real, we can make the real in the virtual: and we can remodel the virtual to be the real we wish it to be. At which point, the notion that we are valued according to our output can be dismissed: there need be no output, in that old, materialist sense.

They can help us fill the gap left by the loss of jobs, by making learning and doing more and more possible (by empowering us, if you like), so that the major problem is in changing our attitude to valuing ourselves through our job (they can take away all the surrounding issues)<sup>0</sup>.

Our delight is that, with computers, we can live in and through education: we can value our selves and we, ourselves, can decide (and argue) our values. Thus, our value to ourselves—of our selves—can grow so that we are left, once again, with the joyful conundrum of the real. For computers are philosophical engines, and we, as users, are just as much philosophers as we are in our everyday confrontation with what we call the world<sup>0</sup>.

And computers are—or they should be—also free: free of cost and free, in the sense of the "Liberated Computer".

## In Practice

The theme of this Conference is "Education for Practice". The context is Architecture, and (education in) Computer Aided Architectural Design (in Europe). I wish to bring this essay towards its end by reflecting some of the above towards the context of the conference's theme, for I believe it is of great relevance to the practice of architecture as we prepare to leave the second millennium<sup>0</sup>.

Aspects of what I consider is a revolution under way are relatively obvious.

The computer as an enhancer of creativity and the handler of calculations can free us architect designers to get on with designing. (This is the constantly held view: that the computer will make us more creative and free us from drudgery. It does not do so in practice, at the moment, because we use computers not for what they can offer, but for what we, in our pitiful imaginings, demand of them.) The computer lets us test our designs better. (Again constantly held: yet so much of what we design from and towards is not yet decently modelled, and much more only produces its output and its data in a form which is the antithesis of what we need when designing—although this problem is now being faced with some success.) The computer can allow the client to better appreciate what is being offered and whether it is what he/she wants. (Another constant: but rarely upheld in practice by members of a profession who feel that their survival and their power lies in controlling what is seen, and when the means of representation are at once so untruthful yet so seemingly honest and transparent.) These are on top of the normal benefits to offices and working: consistency in documentation, improved document

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<sup>0</sup> I remember I am writing from the position of the western welfare state, where there is "massive" unemployment and where we have chosen to support the increasing number of those who are without a job. But to discuss that "reality" is far beyond the bounds of this article.

<sup>0</sup> So we find we learn to question current criteria and values, meaning that we look at them in a different way. There are many questions to be asked, many of which belong to the understandings we have been brought up within, not to what is appropriate in the light of these arguments. We have old questions to ask from new positions, we have completely new questions to ask, and some of the questions we are used to asking are no longer worth asking.

Architecture is, and always has been, concerned with place, space, event and occasion, even if it has not always found these words to express its concerns. At least as far as we, concerned as we are with place, space, event and occasion, can understand. These are the conditions that surround both life as we experience it, and the way we think about life and what it means to us to be alive. These concerns form the questions of philosophy. It follows, then, that architecture and philosophy are close: both provide a shell within which life can be enjoyed and valued. Indeed, place, space, event and occasion equal life. Think about it!

<sup>0</sup> Although I have not written, in particular, about practice, I believe that what I have written is imbued throughout by the notion of practice: the relationship between (the availability of) a job and our self-esteem, the idea of the profession, the notion of continuing education and continuing living, and the idea of a change in practice brought about by the invasion of the areas of the professional.

preparation and publication, excessive and vacuous communication, etc.

But there are different, and much more exciting, benefits available, deriving from the arguments presented in this essay .

To start with, we need no longer be valued as our job, because we can much more easily value our selves when we use the opportunities and support that the computer offers us, especially for education. If we consider education as distinct from training (see above) we can see education as a way of living. In other words, the architect's life, whether building or not, will become one of continuous professional development, in which the computer will be central as the medium making this possible.

Under these circumstances, we are free to expand our understanding of what constitutes architecture by considering what is at its source, what is essential. Architecture has rarely been synonymous with building, and there is no reason why it should be today. If the developer, for instance, wishes to take for him/herself the area of building and we cannot resist, we must find other ways of being architects if we wish to continue in our chosen profession. Buildings (with all their external obligations) do not have to be our only, or even our prime, area of operation. Architects have much to offer, as indicated by the number of them who have made major contributions in areas other than architecture. The whole area of Virtual Reality, especially seen as the creation of new realities, is what architects have been doing for 5000 years. The field of Virtual Reality is ours (and some of our younger students have realised this already)! Computing frees us from the "tyranny" of building—if that is what we want—while there is still a choice. We can design new ways of living and objects with which to live (albeit they are virtual), perhaps for home use. We may even regain some of the area of poetry and, indeed, of the art in and of architecture, that we have given away to installation artists and others.

So, architecture re-emerges, focused on itself, giving its practitioners much of the commoditie, fitness and delight (sic, in Henry Wootton's translation) that Vitruvius so properly determined was what architecture should give everyone else! We can enjoy architecture to the full, and we can enjoy being ourselves in architecture, even making an architecture of joy<sup>0</sup>. We can make

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<sup>0</sup> I do not deny the "cracking of the puzzle" delight that may be got from architectural practice as it is, any more than I deny the pleasure to be got from debugging a computer, But I do question that this is at the heart of creative architecture.

doing architecture a pleasure, not a task, and we can do it without the extravagant complications of causing vast, expensive and poorly modelled/tested buildings to be constructed. If there is no employment we can still do architecture, perhaps an architecture that is nearer the core of architecture than most realised in built form. And an architecture which, because it is not tied in to the work ethic, can do more for us as healthy, sane, emotionally well-adjusted people.

But, for computers to be involved in this beneficially and constructively, we need to demand to get beyond current programs (in essence, stifling, stultifying "key solution" programs that atrophy, and cause our thinking to atrophy with them, such as the spreadsheet and CAD), to programs that increase variety and go beyond both the monolithic and what we can imagine, to surprise us.

## Afterword

Not everyone will wish to involve themselves in such attitudes and actions. Some are afraid of the computer. They, therefore, try to enslave it, to restrict what it can give us to that which we can control. But it is slaves that rise up and overthrow their old masters. We will do better to think of the computer as a partner, an equal, and to learn to recognise how it is different from (and also the same as) us, and what both its and our special qualities and abilities are. We do not need to fear our equals, or those with different abilities that we treat with respect, accepting their differences and looking to mutual confirmation.

But some may find immediate freedom, joy and magic in the computer. Others may come to it slowly through the process of cogitation and consideration, while, for still others, it may be a matter of necessity: in spite of holding on to their current beliefs and modes of operation, they may finally come to the conclusion that there is nothing left to hold on to, and that they might as well let go and swim with the tide. But others will never come to realise this sort of vision, either because it is entirely misplaced and misjudged, or because they will remain as diehards, true to their older tradition. Good luck to them! May they enjoy what is left them.

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