



Dear Mr. President:

Thanks to your incredible support last year, the G & P Charitable Foundation raised close to \$3 million from its very first Gala. We are proud that we are fulfilling my daughter Gabrielle's wish, which was to create a foundation that would help spare others the suffering that she endured. This year alone, the G & P Charitable Foundation will be distributing close to \$1.5 million to promising young researchers at renowned research institutions including: the University of Arizona Foundation for Integrative Medicine, University of Rochester Medical Center, Stanford University School of Medicine, the University of Texas M.D. Anderson Cancer Center, University of Michigan, St. Jude Children's Hospital and Harvard University Children's Hospital.

On ~~Monday, November 13, 2000~~ the G & P Charitable Foundation will host our second bi-annual Gala at the Marriott Marquis Hotel in New York City. We plan to present a Humanitarian of the Year Award, a Corporate Award and an Entertainer of the Year Award. And, as you recall from last year, we plan another spectacular entertainment/musical review with the theme "*The Best of the 20th Century*." It would mean the world to me if you would agree to once again serve as our Honorary Chair and possibly attend the event, schedule permitting.

We plan that our Year 2000 Gala will be even more sensational than last year and your support as Honorary Chair would truly bring it over the top!

With love,

Denise Rich

Denise Rich

The President
The White House
1600 Pennsylvania Avenue
Washington, D.C. 20500

August 5, 1999

*DATE WAS CHANGED
TO THURSDAY, NOVEMBER 30
2000 (SAME LOCATION)
TO ACCOMMODATE QUEEN
NOOR, WHO IS RECEIVING
OUR HUMANITARIAN
AWARD.*



"Love defies all pain, even death"

Gabrielle Rich

THE WHITE HOUSE

WASHINGTON

April 13, 1998

Ms. Denise Rich
Founder
The G & P Charitable Foundation
for Cancer Research
16th Floor
770 Lexington Avenue
New York, New York 10021

Dear Ms. Rich:

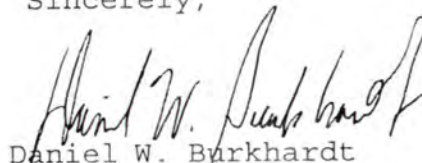
Thank you for your letter requesting that President Clinton serve as Honorary Chairman for your gala dinner-show. I am pleased to inform you that the President has accepted this honor. It will be his pleasure to take part in your efforts in this way, and I am hopeful his participation as Honorary Chairman will contribute to your success.

Because the use of the President's name is governed by certain restrictions, I would appreciate the opportunity to review any printed materials in which you plan to mention the President's honorary role. My office can assure prompt review, but please allow two weeks prior to press time. You may contact Woyna Wondwossen in my office at (202) 456-5492 with any questions.

In addition, I want to let you know that the President's agreement to serve is extended for this purpose only and is not transferable to other functions or bodies.

Thank you again for asking the President to participate.

Sincerely,



Daniel W. Burkhardt
Special Assistant to the President
Director of Correspondence and
Presidential Messages

The *G & P* Charitable Foundation
For Cancer Research



Founded by Denise Rich and Philip Aouad
To fulfill Gabrielle's dream
1969-1996



Staff See Peter
Entergy Corporation
639 Loyola Avenue
New Orleans, LA 70113
Tel 504 576 5876
Fax 504 576 2776
Email wleonar@entergy.com

J. Wayne Leonard
Chief Executive Officer

February 25, 2000

The Honorable William Jefferson Clinton
President of the United States of America
The White House
1600 Pennsylvania Ave, N.W.
Washington, D.C. 20500

'00 FEB 28 PM 3:34

Mr. President:

I appreciate your kind note regarding our efforts to help Entergy's poorest customers and am delighted that your New Markets Initiative is moving forward. As you know, I am a strong believer in working within and supporting our most needy communities and look forward to the day when the two of us can once again tour the Delta region.

The primary reason for my writing you is to urge you to include Pakistan on your upcoming trip to South Asia in March. I believe that engaging Pakistan at this time can safeguard U.S. national security interests as well as U.S. economic interests.

As you may recall from your previous discussions with Jerry Maulden, Entergy is one of many U.S. investors in Pakistan. We are the U.S. shareholder in The Hub Power Company Limited (HUBCO), a \$1.6 billion power generation plant that supplies 16 percent of all of Pakistan's electricity. Through our Power Purchasing Agreement with Pakistan's Water and Power Development Authority (WAPDA), we have committed to providing clean, efficient and competitive electricity to the country for the next 27 years. The political, economic and social stability of the country is therefore vital to our ability to continue to do business in Pakistan.

Entergy is only one of hundreds of U.S. investors in Pakistan. When companies like ours make a commitment to invest in capital intensive projects, like a power plant, we do not have the luxury to pull back if the political climate changes. We are there for the long run. We would ask therefore, on behalf of the U.S. business community operating in Pakistan, to engage the new government with the purpose of reestablishing a mutually beneficial bilateral relationship.

Should you or your staff require any additional information or I could be of service in any other way, please let me know.

Sincerely,

J. Wayne Leonard
J. Wayne Leonard

Send to Burkhardt?

Yes ✓

No _____

coordinate w/ NSC

BC Sig

Carl

cc: Mr. Mack McLarty

Justin G. Cooper
02/28/2000 01:53:16 PM

'00 FEB 28 PMZ

Record Type: Record

To: Betty W. Currie/WHO/EOP@EOP

cc:

Subject: Re: Address



Washington International School
3100 Macomb St NW
Washington, DC 20008
(202) 364-1800

Polus wants to
send these book
to this school.
Can you do a cover
letter.

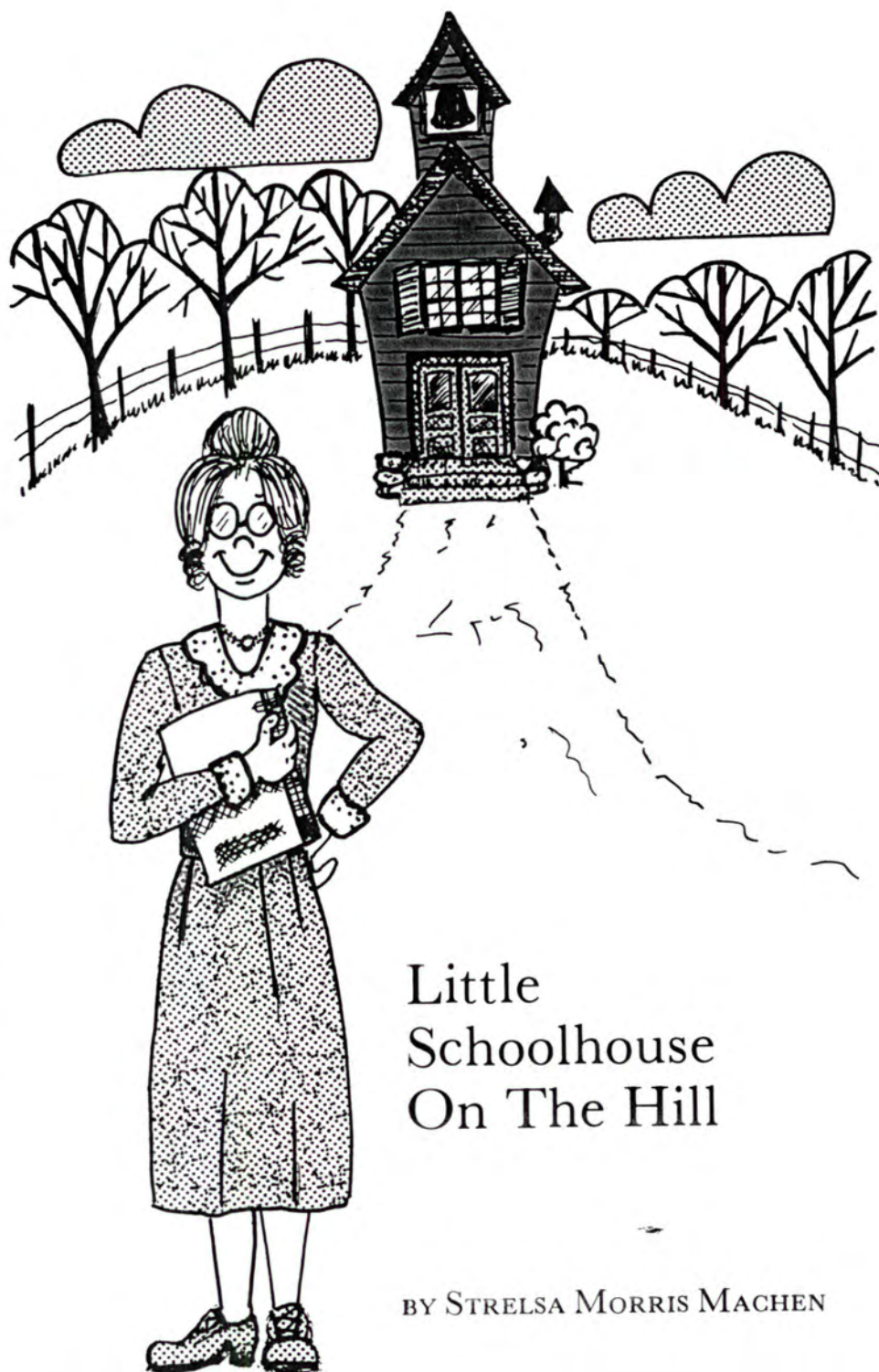
2/28/00

Send to Burkhardt?

Yes ☒

to _____

Cal



Little Schoolhouse On The Hill

BY STRELSA MORRIS MACHEN

Best wishes
Stella Morris Macken

Little Schoolhouse on the Hill

by

STRELSA MORRIS MACHEN

Illustrations by Jill Buster

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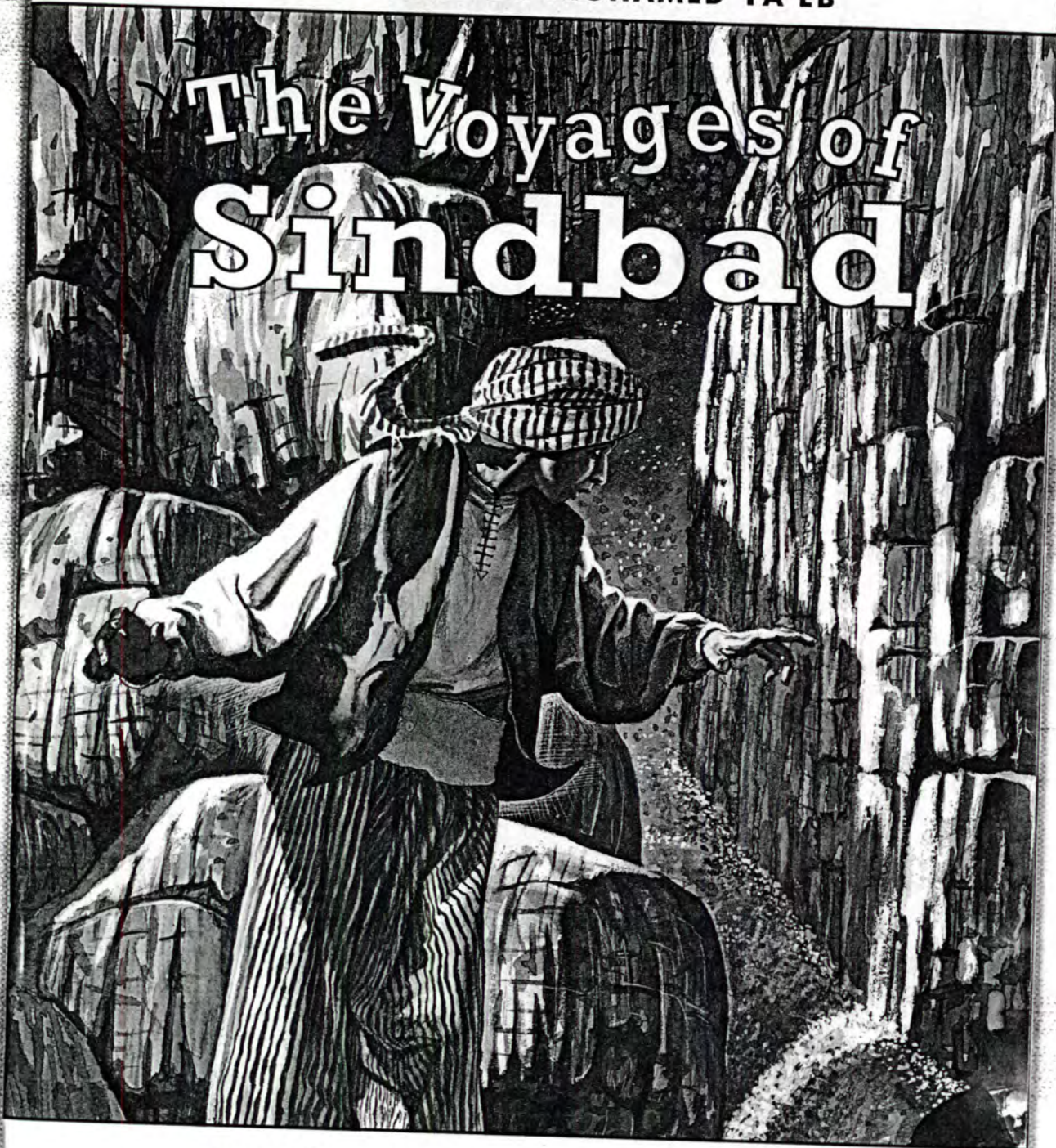
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T

MACHEN

ILLUSTRATED BY MOHAMED TA'EB

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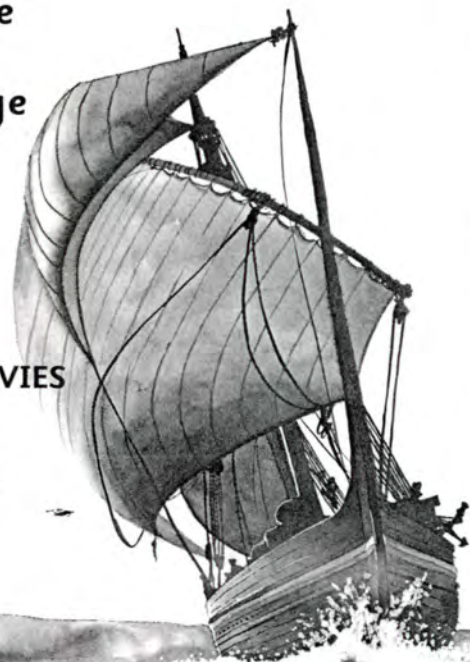
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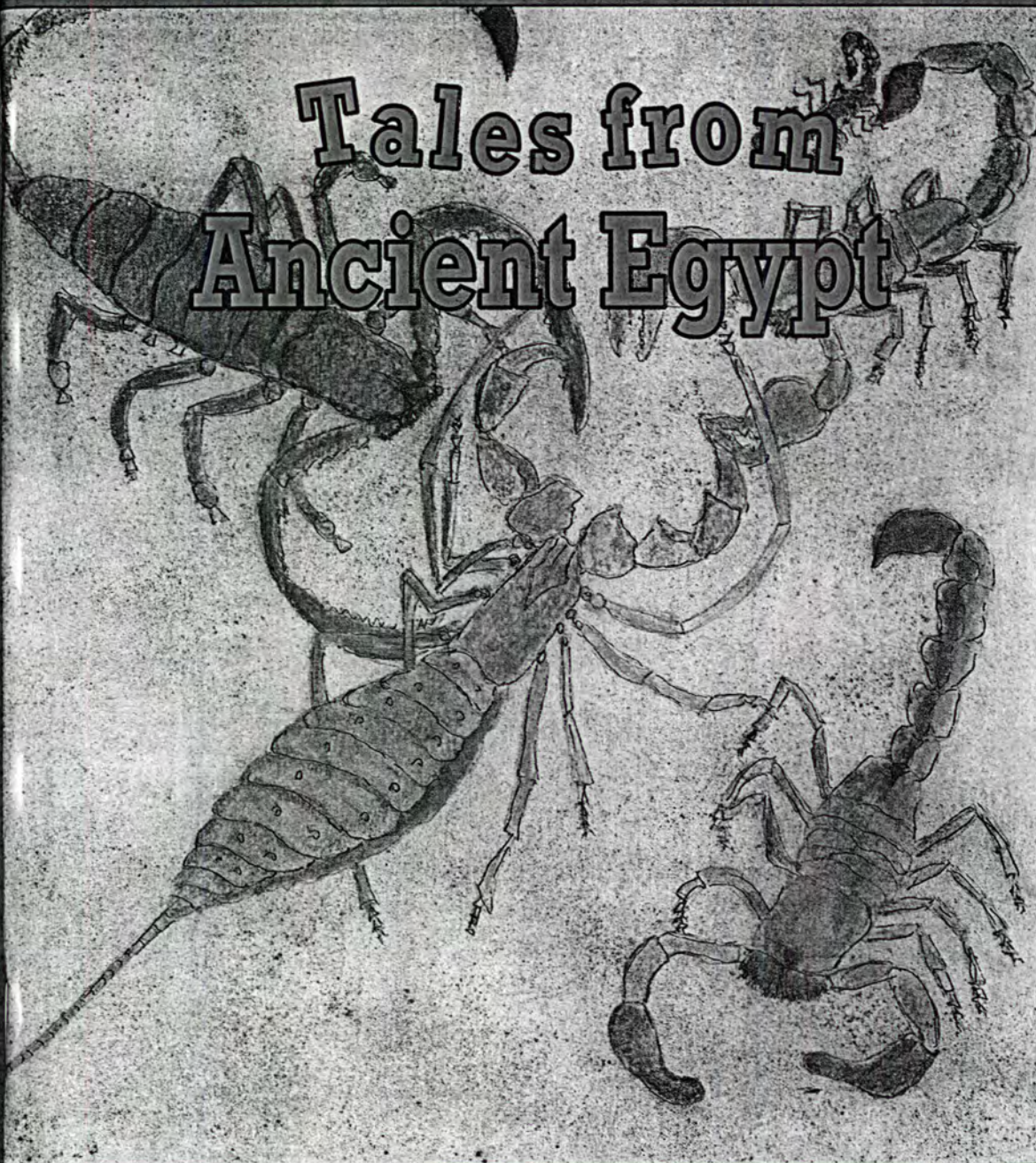
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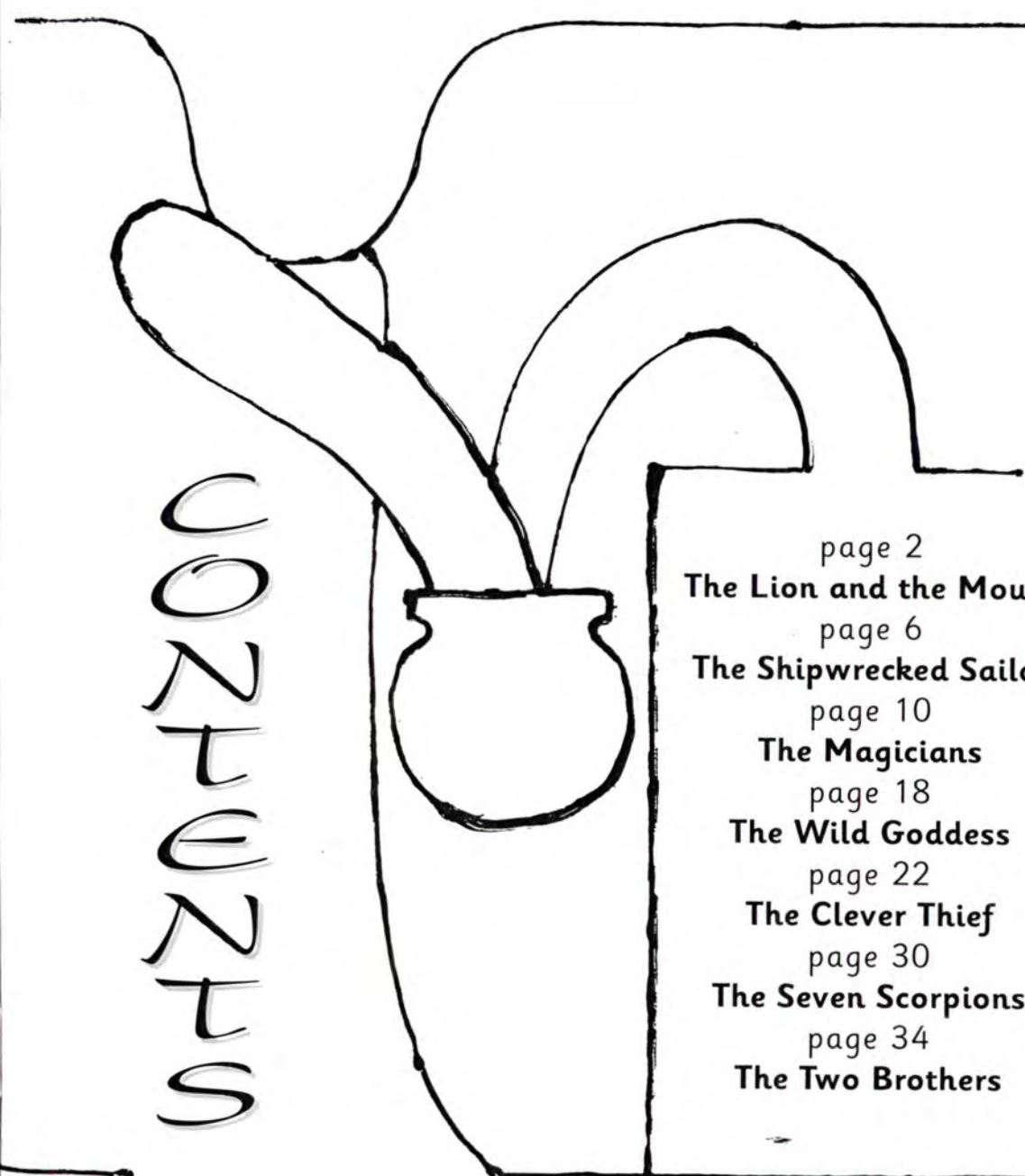
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DENYS JOHNSON-DAVIES
Illustrated by
MOHAMED TA'EB





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GEORGE HART



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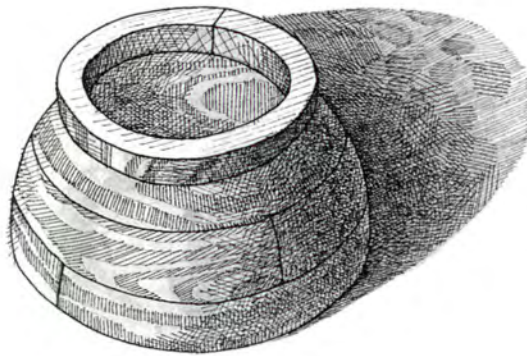
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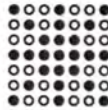
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Retold by Denys Johnson-Davies

Illustrated by Tarek Mossad



The British Council, Cairo

DENYS JOHNSON-DAVIES

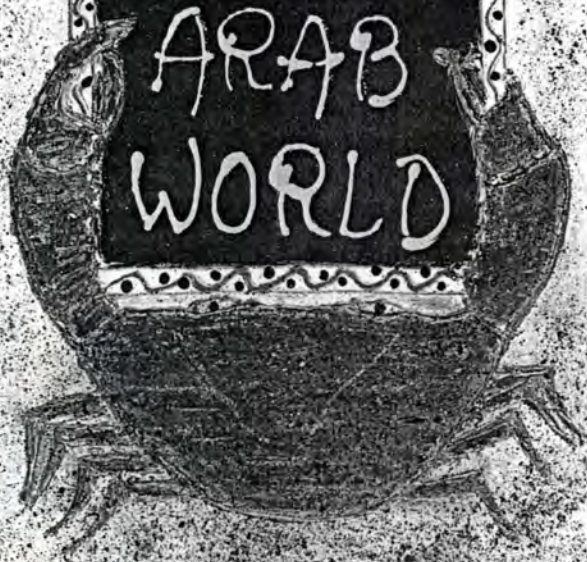


ANIMAL
TALES

from
the

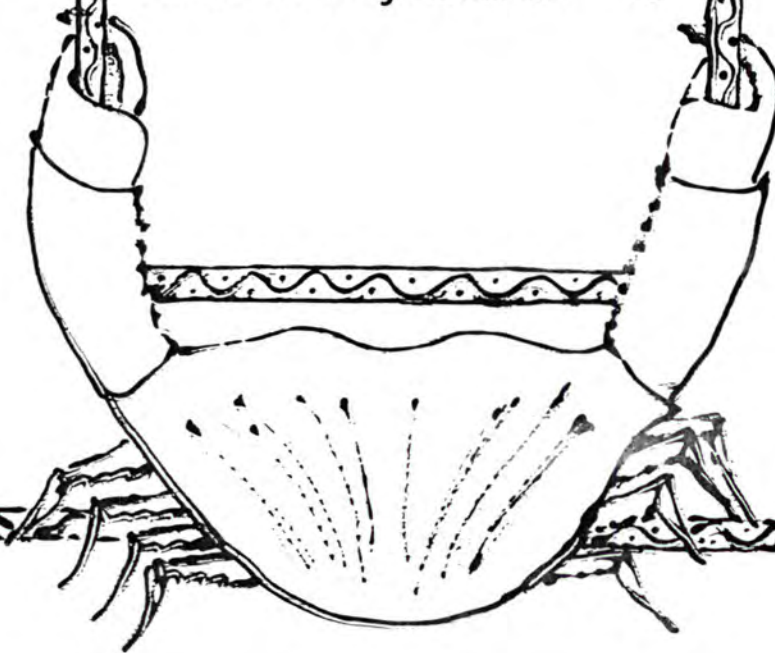
ARAB
WORLD

**ILLUSTRATED BY
EDA S. GHALI**



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ILLUSTRATED BY WALID TAHER

ALADDIN



AND THE LAMP



DENYS JOHNSON-DAVIES

ALADDIN

AND THE LAMP



Retold by Denys Johnson-Davies
Illustrations by Walid Taher

Goha



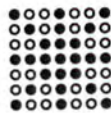
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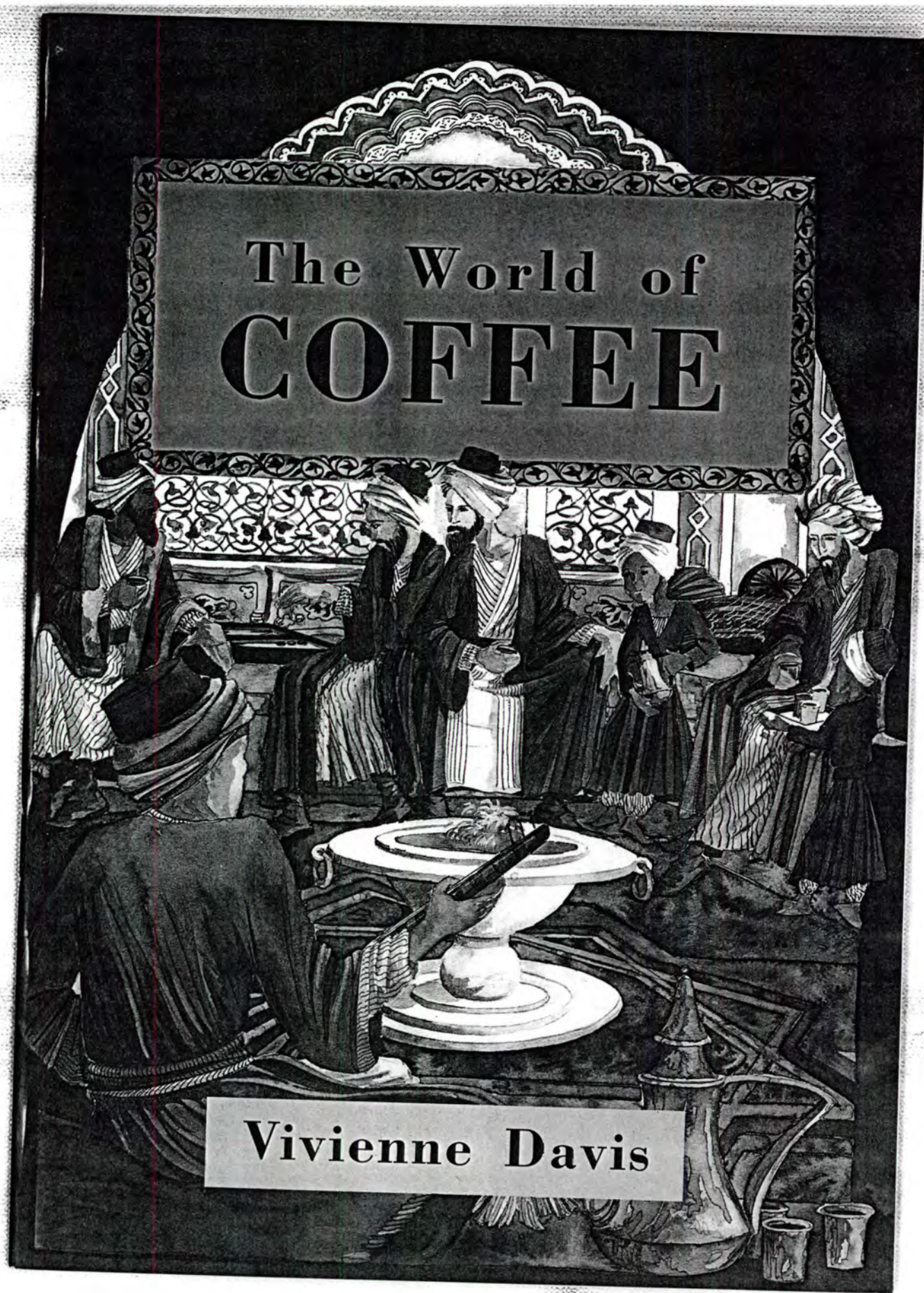
Illustrated by Nessim Girgis



The British Council, Cairo

The World of **COFFEE**

Vivienne Davis



The World of COFFEE

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Suzanne Davis



THE PRESIDENT HAS SEEN

2-28-00

STEPHEN HAWKING

24 February 2000

President Bill Clinton,
The White House,
Washington DC 20500

C. Jennings
What about this?
Can we do it?
BJ

Dear Bill,

I am very sorry that I missed you during your visit to Cal Tech. I had already arranged to give a popular lecture in Cupertino that day and there was no way I could cancel without great upset. I heard that you very generously mentioned me in your remarks as an example of what handicapped people can achieve and it is this that I am writing to you about.

I gather that the Medicare programme is currently reviewing its policy on providing augmentative communication devices. I would urge you to use your influence to ensure that those in need, like I was, can be given such devices. Your help on this important issue would be much appreciated.

I hope to be visiting Washington again in May and would enjoy calling on you again if your schedule permits. I will ask John McCaffrey to liaise with your office to see what might be possible.

Give my best wishes to Hillary in her New York race.

Warmest wishes

Yours sincerely,



Stephen Hawking, CH, CBE, FRS
Lucasian Professor of Mathematics
Centre for Mathematical Sciences
Cambridge University
Cambridge CB3 0WA


copied
Jennings
Podesta



NYC 2/24/00

Dear Nancy -

Stephen Hawking asked that
the enclosed letter reach the
President.

Please thank the President for
the handsome signed State of the
Union address. It was a very
generous surprise and much appreciated.

Warmest wishes,

John (McCaffrey)

212 984 0977

E-COMMERCE

2-28-00

Gruus
Fyl-
Bc

Shopping around the web

A SATURDAY afternoon in mid-December: not a good time to be hanging around San Francisco's Union Square, the city's premier shopping district. Hundreds of people laden with purchases battle along the pavements, search despairingly for scarce taxis or struggle to get through Macy's doors. It is enough to put anybody off shopping for life.

But wait: surely Christmas shopping in 1999 was different? After all, this is close to Silicon Valley, the centre of the Internet revolution and the new economy, the land of the tieless billionaires who bought all their presents online at midnight the day after Thanksgiving. Yet the crowds in Union Square last December were as bad as ever. They seemed oblivious of a large billboard advertisement above their heads for one of the Bay Area's many dot.coms, which flashed the message: "Say Goodbye to the Mall." And they paid no attention to the advertisement on many of their shopping bags that pointed a way out of their predicament: "Online Shopping. No Experience Needed."

Electronic commerce, it seems, still has its limits, even in California. Does that mean its much-ballyhooed arrival is more hype than reality—rather as it is for most of the dot.coms themselves? In some ways, the answer has to be yes. For all the feverish excitement about the tripling of electronic shopping last holiday season, the total spent by American consumers online still amounted to only about 1% of all retail sales—barely a tenth of the revenues from another method of distance selling that has been in use for a century: the catalogue. And the electronic shopping was concentrated on quite a narrow range of goods: mainly books, toys and music. Worse, the holiday season threw up as many stories of failed and late deliveries as of explosive growth. And, more recently, a string of hackers' attacks have temporarily disabled some of the best-known e-commerce websites. Perhaps retailers in the physical world need not lose much sleep over the Internet, or at least not yet?

Nightmare on e-street

Yet they are losing sleep, and are right to be doing so, for three reasons. The first is that mighty oaks from tiny acorns do grow. Electronic commerce may not amount to much at the moment, but it is growing very fast. In business-to-business transactions, in particular, the advantages and cost savings to be had from dealing on the Internet have caused e-commerce to mushroom. At present, such transactions account for as much as 80% of all e-commerce, which, according to Forrester Research, an Internet consulting firm, added up to over \$150 billion last year. Forrester predicts that by 2003 that figure could reach over \$3 trillion. But even in the business-to-consumer field, the main subject of this survey (business-to-business e-commerce was the subject of a survey on June 26th 1999), the growth of online commerce has been extremely fast—despite con-

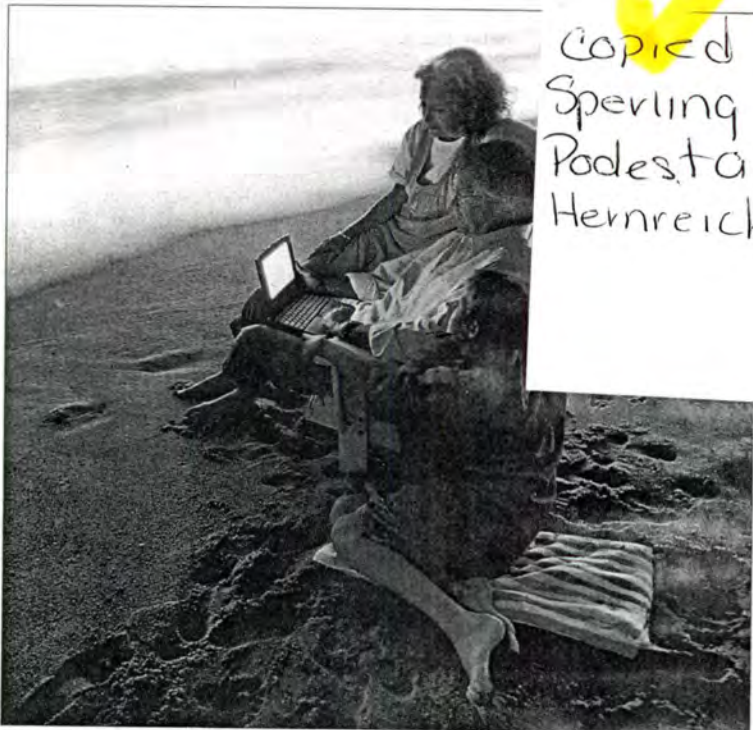
sumers' undoubted attachment to their traditional methods of shopping.

The second reason concerns critical mass. In many areas of retailing and commerce, the Internet is unlikely to capture more than a few percentage points of the market for several years to come. But even a small share can quickly start to have a big effect. In the travel business, for instance, margins are so thin that a loss of only 3-5% of the market to the Internet threatens to drive large numbers of traditional travel agents out of business. According to Shop.org, an online retailers' group, in 1999 online penetration of the American travel market had already reached almost 2%.

The third reason is more worrying still: traditional retailers, for all the strengths of their brand names and their existing relationships with suppliers and customers, have found it extraordinarily hard to compete online. The geeks sneer that this is because the physical vendors do not "get it". But, as this survey will argue, that is not the real problem. Rather, there are formidable obstacles that stand in the offline intermediaries' way. It may turn out that the biggest effect of online business-to-consumer commerce is not its size, but the way it changes the rules of the retailing game—to the evident perplexity of those who have hitherto played it best.

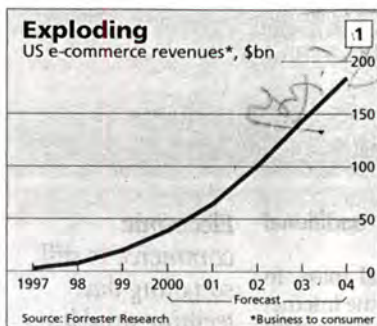
Even so, the place to start is still with the size of the business and how fast it is likely to grow. According to Forrester, online business-to-consumer transactions in America were worth some \$20 bil-

Electronic commerce is still so young that teething troubles were only to be expected. But just watch it grow, says John Peet



Three ice-creams to go, please

Copied
Spierling
Podesta
Hernreich



lion last year. Forrester expects that figure to grow to some \$184 billion by 2004 (see chart 1). Other analysts, such as Jupiter Communications and the Yankee Group, have come up with similar predictions, as has the annual report by the Boston Consulting Group for Shop.org. A survey by Ernst & Young, another consulting firm, suggests that 39m Americans, making up 17% of households, shopped online in 1999, and that nearly half of them spent \$500 or more. Within just a few years, the Internet could capture 5% of America's retail market, with other rich countries likely to follow in its wake. By 2010, forecasts Goldman Sachs, an investment bank, electronic shopping could account for 15-20% of retail sales. Jeff Mallett, president of Yahoo!, the biggest Internet portal, predicts that online retailing will grow "as fast as e-mail".

The catalogue case

Could these forecasts prove wildly wrong? It is worth recalling that catalogue shopping once started almost as explosively as the Internet. Sears Roebuck published its first catalogue in 1888. At the time delivery was slow or non-existent, but the idea caught on quickly, and for the next five years catalogue shopping grew by leaps and bounds, with the annual rate of increase never falling below 25%. The sales pitch was remarkably similar to today's, too: no need to struggle to the store, a huge choice, the lowest possible prices. Yet after the novelty had worn off, the growth of catalogue shopping slowed sharply. Today, the sector takes a steady share of about a tenth of all retail sales in America, and less than that in other countries.

So far, Internet shopping has been rather like catalogue shopping, which is one reason that many catalogue retailers have proved good at it. Some observers predict that it will never amount to much more than this. Yet there are good arguments for expecting the net to make much greater inroads into retailing than catalogues have done. For a start, it is faster and far more convenient: the shopfront can change from minute to minute, and orders can be placed instantly. Technological change will continue to make it even easier: faster connections from the home will vastly improve website access, as will the use of mobile telephones and other handheld

devices to go online. The recent trend of mixing online and offline retailing could also benefit consumers. For example, call centres could be used to help them navigate around the retailer's website, and new warehouses and distribution centres are beginning to remedy one of the Internet's biggest weaknesses: order fulfilment and delivery.

Meanwhile, a welter of new techniques that the Internet has made possible, ranging from auctions to instant price comparisons, and from customer aggregation to one-to-one marketing, will help to make online shopping cheaper, and often more entertaining, than real-world shopping. And it would be wrong to place too much weight on consumers' innate conservatism. It is true that shopping fulfils a social function that the web cannot easily replicate, but that did not stop the momentous shifts from corner shops to supermarkets, and then from supermarkets to giant out-of-town discount retailers, that have taken place within the past 50 years. Generational change also seems certain to boost the use of the web for e-commerce: kids who grow up with computers are likely to find that doing their shopping on them comes naturally.

This survey will argue, then, that despite its teething troubles, business-to-consumer electronic commerce will grow significantly, and that it will be especially important for certain kinds of goods and services. It is therefore bound to have a huge impact on offline commerce. Goldman Sachs suggests that the rise of e-commerce will cause average growth in offline retail sales over the next decade to slow down from 5% to 3% a year. That may help explain why the shares of many retailers have been doing so badly of late, despite a consumer boom.

The effects of e-commerce will also be felt in pricing, which is likely to become much more competitive, and in the structure of the retail business. Existing intermediaries, from retailers to stockbrokers to banks, may find their role has been redefined or eliminated. The emergence of new intermediaries such as shopping robots will add further complexity. In general, wired consumers are likely to benefit at the expense of producers and, especially, of middlemen who add little value to transactions. Governments, taxmen and the unwired all risk being left behind. And all this could happen in Internet time—ie, faster than anyone expects. But before this survey gets bogged down in too much netspeak, it will start with some definitions and a bit of economic analysis.

Define and sell

Where e-commerce wins hands down, and where it doesn't

IT IS tempting to use the phrase "electronic commerce" without troubling to define it, but there is something to be said for being a little more rigorous. E-commerce refers to trade that actually takes place over the Internet, usually through a buyer visiting a seller's website and making a transaction there. Clearly the influence of the web—for example, as a source of information—stretches much wider than this. One estimate suggests that, although only 2.7% of new-car sales in America last year took place over the Internet, as many as 40% in-

volved the net at some point, with consumers using it to compare prices or to look at the latest models.

Within this broad definition of e-commerce, it also helps to be clear about the main actors, ie, businesses and consumers. At present the biggest volume of trade by far is business-to-business, typically for suppliers to such large companies as General Electric. Several technology companies, including Cisco and Oracle, have transferred almost all their purchasing (and indeed most of their sales) to the web. Web-based business-to-business exchanges

have mushroomed. Even such long-established businesses as America's two biggest car makers, Ford and GM, say they are transferring all their purchasing to the web within the next few years.

This survey, however, is concerned with the remaining three segments of e-commerce: business-to-consumer, consumer-to-business and consumer-to-consumer. The first embraces normal retail activity on the web, such as bookselling by Amazon.com or online stockbroking by Charles Schwab. The second, as yet smaller, takes advantage of the Internet's power to drive transactions the other way round: would-be passengers bidding for airline tickets on Priceline.com, for example, leaving the airlines to decide whether to accept these offers. The third covers the new fashion for consumers' auctions, epitomised by the auction site eBay.com. The shorthand for these segments is B2C, C2B and C2C (see chart 2).

What has the Internet, or more specifically the World Wide Web, got to offer in all these areas? John Hagel, a consultant at McKinsey in Palo Alto, points to ease of price comparison and greater choice as its two biggest plus points compared with the physical world. The web's reach is global—no limits of shelf space or warehousing—so it ought in some respects to be able to outdo the real world. Amazon quickly proclaimed itself the world's biggest bookseller, even though its own physical stock of books was tiny. eBay aggregates bidders around the world, giving it a huge advantage over the local flea market.

On the other hand, websites are not much good for replicating the social function of shopping, nor for browsing around, nor for producing the serendipity and impulse purchases that come from visits to a shopping centre. Nor, because it usually depends on separate delivery, can e-commerce offer the instant gratification that today's consumers have come to expect. The Internet may work better for replacement buys than it does for new purchases. And fulfilment must always be brought into the equation: goods that are heavy or bulky will be harder and more expensive to sell online than light, easily transportable ones.

Then there is the question of what kinds of

goods and services sell well electronically. The simplest distinction here is between "high touch" and "low touch". The first category includes clothes and shoes, as well as many groceries, which consumers often prefer to be able to see and poke before they buy. The second takes in such products as computers, books and CDs. Pornography, the earliest big seller on the web, may rate a special category of its own. In general, it is low-touch items that have sold best on the web so far (see chart 3 on next page). Yet the distinctions are blurring: catalogue experience suggests that consumers will buy clothes without trying them on, and the Internet may yet offer "virtual" fitting.

Chart 3 also shows some goods and services that are tailor-made for the web: those that can actually be delivered over the Internet. Computer software is the most obvious example, but increasingly such things as airline tickets, stockbroking services, banking and insurance, and even books and newspapers are being delivered electronically. Anything with content that can take digital form, which includes most recorded music and film, is especially suitable for the web—indeed, the economics of the web could easily kill off the traditional distribution channels for such products. The same may apply to many financial services.

Cash and carry

What works well in e-commerce is not predetermined for ever. Technological change is increasing the possibilities all the time. Development of more secure payment systems could help. Consumers are often advised against giving their credit-card numbers freely over the Internet, and this remains one of the most-cited reasons for not buying things online. Smart cards and digital cash would get round this, as well as making it possible to use the web for small purchases. Yet it should be said that the great credit-card fear has not, so far, proved well-founded: there have been very few instances of theft of credit-card numbers, and, even if there were any, the credit-card firms would shoulder most of the liability. Using a credit card to pay over the telephone is riskier. The increasing acceptance of the credit card for payment over the web may, indeed, be hampering the development of smart cards and digicash.

Technological change to improve speed and capacity is probably more important. The biggest boost to e-commerce over the next few years will come not from snazzier websites or snappier marketing, but from the proliferation of broadband Internet connections to the home as more and more people acquire cable modems or DSL lines, both of which are much faster than the dial-up modems in use today. One reason why America Online, the world's biggest Internet service provider, was so eager to buy Time Warner was that it wanted to secure access to the entertainment company's cables.

Besides quicker access to the web, two other huge changes loom that are likely to boost e-commerce. One is that mobile telephones and a host of other electronic devices are now being hooked up to the web, ousting the personal computer from its monopoly position in providing Internet access. The

The e-commerce matrix 2

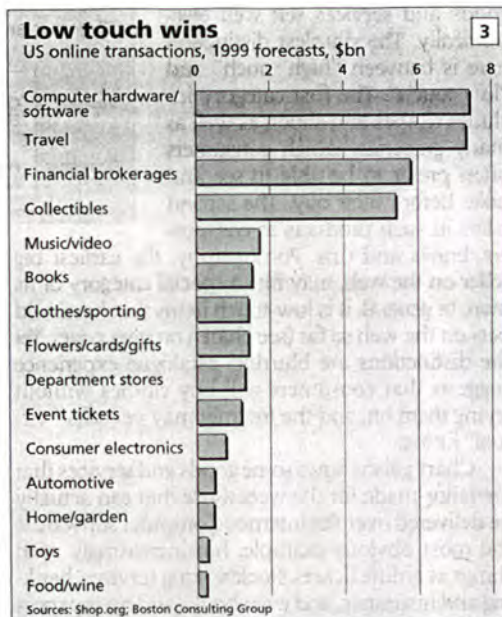
	Business	Consumer
Business	B2B GM/Ford EDI networks	B2C Amazon Dell
Consumer	C2B Priceline Accompany	C2C eBay QXL

Source: The Economist



Down with stocks





second is the linking of websites to call centres, so that customers can ask for direct personal advice as they surf; the telephone operator may even be able to take control of the browser to help guide a customer. A catalogue operation such as Land's End is already exploiting the link between its website and its call centre to make better use of the Internet.

Indeed, the experience of such catalogue sellers as Eddie Bauer and L.L. Bean suggest that the scope for web retailing may turn out to be a lot bigger than it seems at first sight. Clothes and shoes have both won a place in the catalogues, even though they are high-touch goods. An even more striking example is raw steaks: Omaha Steaks has a strong catalogue business selling steaks by post that it is transferring to the web. Many adventurous online merchants now reckon there may be no such thing as a product that is unsuitable for being sold over the web.

A walk through webonomics

That is the more striking, given the economics of the web, which look powerful. The most obvious gains come from cutting out shopfront costs and intermediaries, and from cheaper distribution. Book retailing on the web, for instance, means dispensing with big shops full of slow-moving stock: orders at Amazon.com go straight to the wholesaler (the reason the firm is based in Seattle is that America's biggest book wholesaler is there). Not needing much working capital is also a bonus: an online retailer usually gets paid before he has to pay his distributor, whereas in the physical world it is the other way around.

These gains should not, however, be exaggerated, if only because there are big offsetting costs. Running and servicing a website to ensure that it is 99.999% reliable (the ideal "five nines" goal) is not cheap. Logistics and distribution, too, are so critical to an e-commerce venture's success that it often has to spend heavily on them. And there are big marketing expenses (optimistically known as customer-acquisition costs) as well. Although many online retailers have managed to undercut their offline rivals on price, they have also managed to lose huge amounts of money in doing so.

Then there are the economic gains from the things that are possible on the Internet but not in the real world. Paul Saffo, of the Institute for the Future in Palo Alto, suggests that the biggest impact of the Internet may come when, like earlier technological revolutions, it gives rise to entirely new products. For existing ones, price comparisons become far easier (and can be made automatic) when it is a matter of clicking, not walking. That suggests the Internet could be a strong price-deflation mechanism: raising your prices is harder when your customers instantly compare them with everyone else's.

Economies of scale and scope are also easier to obtain online than offline. A single website can be used to cover the globe: once it is set up, and subject always to fulfilment problems—of which more later—it is eminently scalable (the current buzzword for the ability to get bigger without a big rise in costs). Similarly, it is far easier for a website that is successful at selling one product to branch into others. And the web allows things like customer aggregation and auctions to be done in ways that are impossible in the physical world.

Data can also be exploited far more readily on the Internet than in the real world. Everything can be recorded: not just every transaction, but which web pages a customer visits, how long he spends there and what banner ads he clicks on. This can produce a formidable array of data that makes possible both one-to-one marketing—directing sales pitches at particular individuals—and "mass customisation"—changing product specifications, for instance for jeans or computers, to match individual orders to the individual customer's preferences.

The Internet could, in short, overturn much of the traditional economics of retailing. Philip Evans and Thomas Wurster, consultants with the Boston Consulting Group, have proposed one methodology for assessing the web's effects on the industry*. They consider three factors: reach, richness and affiliation. Reach refers to the size of your audience, richness to the intricacy and customisation of the services you can offer, and affiliation to the extent to which you are seen to respond to your customer's interests.

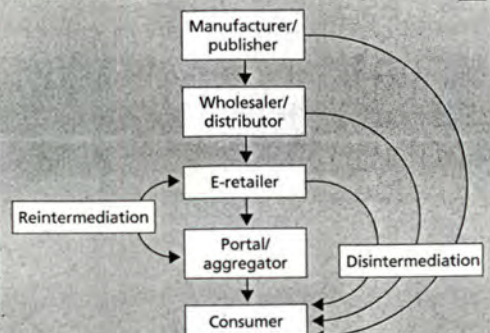
In the physical world, these often have to be traded off against each other: go for a big audience and you lose familiarity with individual preferences, for example. The prize offered by the Internet is that you can do them all together. Reach can be huge because you are no longer constrained by physical space; but richness need not be sacrificed, since online—and assuming the right plant design and relationship with suppliers—a bespoke service such as Dell Computer's can be as easy and cheap to offer as an off-the-peg one.

Another approach is to re-examine the normal value chain for retailing. The web makes it possible to dispense with much of this chain altogether, through direct sales by manufacturers to consumers. But as Bill Gurley of Benchmark Capital, a venture-capital firm in Silicon Valley, notes, it can also create new points on the value chain, such as Internet portals that act as shopping malls, or aggregators that offer a new way of amassing buying power

*"Blown to Bits", by Philip Evans and Thomas Wurster. Harvard Business School Press, 1999.

Rebuilding the value chain

4



Sources: Benchmark Capital; The Economist

(see chart 4). Pierre Omidyar, who founded eBay, stresses the power of portals: many web-surfers arrive first at Yahoo! or AOL, giving such firms huge leverage over retailers that need to be on their sites.

Examples now abound of how this works in practice. Dell, famously, has carved out its profitable niche by selling direct, first by telephone and now via the Internet. Michael Dell, the firm's founder, suggests that the car industry should adopt his model; and, indeed, both GM and Ford have been buying out dealers with a view to moving to direct distribution. (On the other hand, Levi's has stopped selling its jeans direct over the web.) Travel agents

are being disintermediated all over the place; so are the record shops. Electronic goods are being sold to buying clubs or through auctions. Books are being delivered in packages of one by wholesalers, or even published direct on the web, cutting out not just booksellers but publishers and wholesalers as well.

Its early apostles thought the web was a good thing because it would disintermediate in these ways, bringing savings to both manufacturers and consumers at the expense of those in-between. Yet what is emerging as often is that the Internet is changing the role and function of intermediaries, not eliminating them. Mr Evans talks of "navigators" that will spring up to represent customers seeking to get the best out of the web. McKinsey's Mr Hagel has coined the word "infomediary", a new beast that will look after individuals' concerns over privacy or payment security.

Whichever fancy-sounding model comes to pass (disintermediation, navigation, infomediation, whatever), they all share one common feature. They threaten the cosy world of the traditional intermediaries in commerce, many of whom have for years lived off mark-ups while adding little value. The fiercest battles between old and new intermediaries are being fought in retailing.

"Net Worth", by John Hagel and Marc Singer. Harvard Business School Press, 1999.



Something old, something new

THE conventional wisdom about traditional retail firms (often known as legacy businesses) and the web has been redefined several times in recent years. In the early phase, from about 1995, it was said that the legacy folk just did not "get it"—leaving the field clear for electronic traders such as Amazon, CDNow and E*Trade, an online stockbroker, which are known as "pure plays". Even when the legacy businesses started to make their own forays into trading on the web, their efforts were often derided in Silicon Valley and Seattle. A new verb entered the language: to be "amazoned", meaning to lose a big chunk of your business to a web upstart.

About 18 months ago, however, this view started to be modified. The relative success on the Internet of Barnesandnoble.com (now bn.com), a joint venture between the real-world bookseller and Bertelsmann, a German publishing giant, and of such catalogue businesses as Land's End, began to make the pure plays sit up. Even Toys "R" Us, a troubled toy retailer that seemed to have been amazoned by eToys, a new pure play, started to recover some lost ground, despite serious problems with its Toysrus.com website and with order fulfilment.

The conventional wisdom has now shifted once again, to almost the opposite of where it started. A popular line is that the pure plays have had their four years of fun, but now that the big boys, such as Home Depot, Merrill Lynch, Kmart and Wal-Mart, are seriously moving on to the web, they are likely to demolish their virtual rivals: Amazon.toast, in the vernacular. All figures about commerce on the web are murky, but one bit of evidence to support this

new view is the online retailers' stunning lack of profits—and their recently falling share prices. Yet, of the top 20 retail websites ranked by visitors during the holiday period at the end of 1999, only five were offshoots of legacy businesses—though these have generally been the fastest-growing sites (see chart 5 on next page).

On the face of it, the legacy businesses ought to have some significant advantages over the pure

There may be room online both for established firms and for virtual newcomers. But which ones?



Legacy shopping



plays. They have an established brand name, a huge customer base, and strong links with suppliers that enable them (especially if they are big enough) to demand deep discounts. They also have a range of shops that should be of some value for fulfilment and distribution, as well as making life easier for customers who like to combine online and offline shopping, for instance by returning products they have bought over the web to a physical shop. For those who look on the Internet as essentially just another distribution channel, along with shops, telephone selling and catalogues, it seems natural that the legacy firms should come to dominate it.

A legacy too far

Maybe they will. But there are several large obstacles in the way, and it is these obstacles that provide the answer to another puzzling question: why have almost all the legacy businesses, whatever field they are in, been so slow to respond to the arrival of the web? It is not as if all their managers are technophobes, knaves or fools. Many quickly realised that e-commerce could pose a serious threat to their existing business.

The problem the legacy firms face is that the Internet appears to be more than just another new technology for them to adopt easily. It is more like a "disruptive technology", a phrase coined by Clayton Christensen, of the Harvard Business School*. A disruptive technology overturns a traditional business model, which makes it much harder for an established firm, with its own cultural inertia, to embrace. The reason is simple: those who have invested money, time and effort in the previous business model—suppliers, employees, bankers, shareholders, even customers—are likely to resist the change.

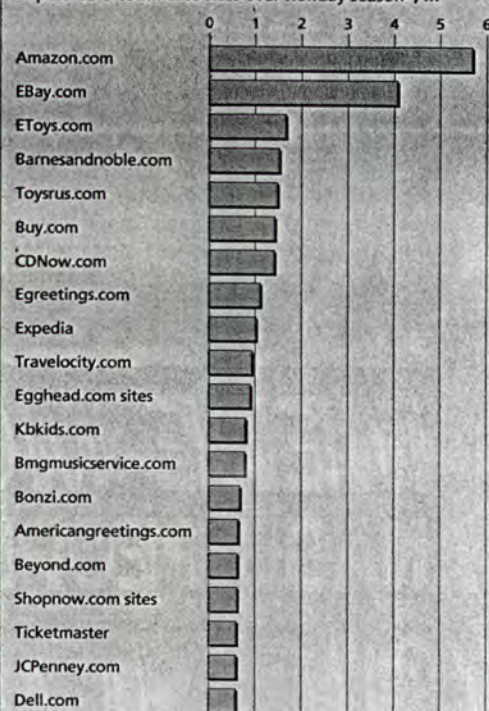
This problem can manifest itself in many ways:

- Fear of cannibalisation. A new distribution channel is vulnerable to the charge that it is not creating a new market or extra sales but merely siphoning off existing sales from other channels. This charge will be especially pointed if, as with the Internet, the new channel tends to offer lower prices: if it merely displaces sales, the net effect on the bottom line will be negative. Several booksellers, including Barnes & Noble, were slow to embrace Internet retailing partly because they feared that selling books at lower prices would dent their profits.
- Partly because of fear of cannibalisation, a legacy firm moving on to the web risks "channel conflict". Existing sales forces and intermediaries will fight hard against a new distribution channel that seems to threaten their business. For example, the sales staff of Merrill Lynch, America's biggest stockbroker, fought hard against starting an online stockbroking operation; at one point Launie Steffens, boss of the firm's retail operation, reassured them with an embarrassing attack on the Internet, which his firm then embraced soon afterwards. Levi's, which made great play of direct sales of jeans over the web when they began two years ago, has been forced to stop because its other retail channels objected vociferously to being sidestepped.
- Firms that have tried to branch into e-commerce have found the capital markets particularly awkward to deal with. For most of the past four years, the markets have rewarded pure plays with stratospheric share prices, making capital virtually free,

Surfers' paradise

Top 20 US e-commerce sites over holiday season*, m

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Source: Media Metrix

*Average weekly visitors, Nov 14th - Dec 26th, 1999

even as most of them were running up huge losses. Yet legacy firms have continued to be judged on normal earnings criteria, so when they have plunged into a web operation that has lost money, their shares have often been punished, not rewarded. In effect, the capital markets have, at least until recently, been sharply tilting the playing field in favour of the pure plays (see chart 6, next page).

• The high valuations placed on Internet shares have also caused problems over both pay and acquisitions. Offer a talented young website-designer a choice between joining a company like Amazon, which can reward him with stock options that hold out the promise of untold wealth, or a boring old retailer like Macy's, and which will he take? Equally, frothy shares have given pure plays a new currency to use to buy up promising competitors, which legacy firms have been unable to afford.

• Offline companies might be expected to have an advantage in distribution, but their distribution systems tend to be of the wrong sort, geared to shifting pallets of goods from large warehouses to store shelves. Selling over the web requires a completely different warehouse-cum-truck system that can deal with delivery of a single package to an individual household.

• Thanks to their brands and their customer base, established firms may indeed be able to spend less than pure plays on marketing. But their information about customers also turns out to be of the wrong sort. A big discount retailer will know exactly what sells and in what quantity, allowing the firm to fine-tune its stock and shelving plans. But it often has little idea who its individual customers are; nor are re-

*"The Innovator's Dilemma", by Clayton Christensen. Harvard Business School Press, 1997.

tailers in general much good at mining the data they do collect, eg, from credit-card slips. The web, however, is perfect for collecting, storing and exploiting individual data—recommending similar book titles, offering information on what a customer has bought before and so on.

• Lastly, the economics of the Internet seems to offer a powerful first-mover advantage. An e-commerce operation on the web can be scaled up at low cost in a way that its physical equivalent cannot. This does not mean that the first mover will automatically win: Amazon was not the first bookseller on the web, nor was eBay the first auction site. But if an early mover gets everything right—its website, its order fulfilment, its distribution—a newcomer might find it much harder to knock it off its perch than it would in the physical world.

There are plenty of recent examples to show how hard it can be for established firms to adapt in time to fend off new challengers. Look at the computer industry, for example: ranging from the capture of a large chunk of the PC-making business by Compaq (thanks to its low-price strategy) to the recent squeeze that Dell and Gateway have, in turn, put on Compaq. Or, in retailing, look at the way that Sears Roebuck knocked out a whole bunch of small hardware stores when it introduced its catalogue early last century, only to be ousted in turn from its position as America's largest retailer by Wal-Mart's giant out-of-town superstores in the late 1960s.

Blessed are the pure

It would be a mistake, then, to regard the newcomers as just so much cannon fodder for their experienced rivals. But it would be equally wrong to minimise the problems that the pure players themselves now face on the web. There is so much noise on the Internet that getting sufficiently well known to win customers can be quite hard. In the physical retail world, you can simply put a snazzy new store on a good site and wait for passers-by to come in. On the web you need to do far more to attract attention. Hence the wave of dot.com advertising last year, which in the end threatened to swamp many of the advertisers—some of whom spent as much as three-quarters of all the cash that they had raised from venture capitalists on marketing.

The capital markets, too, seem, slowly and belatedly, to be overcoming their infatuation with dot.coms. New companies of this kind now often find it harder than they expected to raise venture capital, unless they can show that they have a genuinely new business model; if they are following in

somebody else's footsteps, their lack of originality will be held against them. And lack of profits could yet turn out to be a big problem: the shares of several e-commerce firms have fallen back sharply from their peaks (see chart 7, next page). It is notable that nearly three-quarters of e-commerce-related IPOs since mid-1995 are now trading below their issue price. The markets are beginning to fear that a dearth of profits may be something other than just a reflection of high customer-acquisition costs. Instead, it may be a consequence of the increased competition that the Internet has created, and of high fulfilment and distribution costs.

Moreover, as established firms begin to grasp why they have found it so hard to succeed on the web, that knowledge could help them to overcome the obstacles. Consider the example of Charles Schwab, now America's biggest online retail stockbroker. Until 1996, it operated largely as a discount telephone broker, though it had a few physical offices as well. Then it set up an online operation called eSchwab which charged lower commissions, but soon became engulfed in the usual problems of cannibalisation and channel conflict. So in January 1998 the firm restructured to turn itself into a single, mainly online business, subsuming the former discount-broking business. The changeover was both painful and expensive, but Schwab has emerged with a capitalisation that rivals Merrill Lynch's.

There are other signs that established firms are starting to "get" the web. To avoid overt channel conflict and also to benefit from high Internet share valuations, several of them have set up separate online subsidiaries, such as bn.com or Toysrus.com. Others have formed partnerships. Kmart, for instance, has linked with Yahoo!, an Internet portal, to market its Bluelight.com site on Yahoo's shopping mall. Bestbuy has teamed up with Microsoft's online service. And in the pharmacy business, several of the physical chains now have links with online operations. Peter Neupert, chief executive of the biggest online drug retailer, drugstore.com, has cemented an alliance with the Rite Aid chain, in part to make it easier for drugstore.com to capture some prescription trade from the offline "pharmacy benefit managers" that control it.

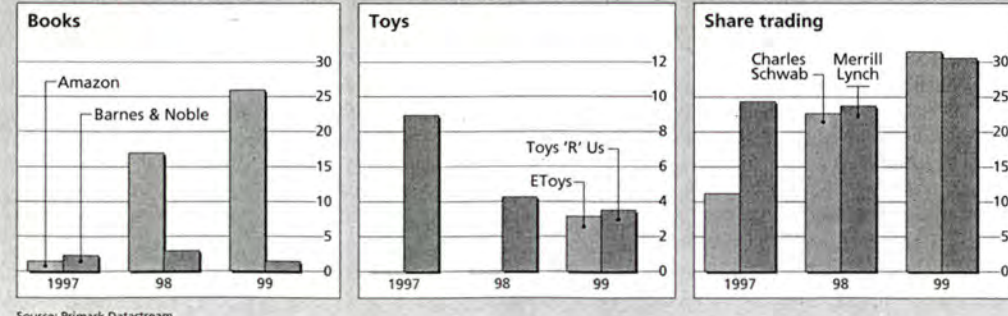
But the most interesting recent deals have been those of Wal-Mart, the world's biggest retailer. Although feared by its competitors everywhere, the firm has nevertheless suffered many of the same problems on the Internet as other legacy firms: its website has been poorly designed, choice has been minimal and delivery uncertain. Yet it seems to be



Advantage upstarts

Market capitalisation, end year, \$bn

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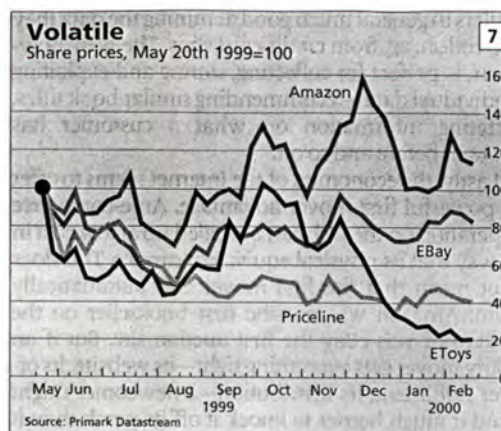




learning. It has teamed up with America Online, the world's biggest Internet service provider, to promote a relaunched and vastly expanded website that opened for business in January. It has also formed a joint venture with Accel Partners, a Silicon Valley venture-capital firm, to set up a separate Wal-Mart.com subsidiary that it plans to float off.

Jim Breyer, of Accel Partners, who will sit on the board of Wal-Mart.com, declares that the future lies with firms that seamlessly integrate the online and offline worlds. He cites the AOL/Time Warner merger as an example of what is to come. Within a few years, he predicts, the distinction between online and offline will become blurred anyway. His aim is to use Wal-Mart's brand, financial strength and offline logistical strength to build Wal-Mart.com into the best in the online world as well.

Will mixing the best of online and offline, which has been variously labelled as "clicks'n'mortar", "clicks and bricks" or the more prosaic "multichannel", produce the e-commerce winners of the future? Maybe; and it is noteworthy that several pure plays are building physical shops. Michael Dell argues that offline shops will survive by becoming



showrooms or places for enjoyment, with most buying taking place on the Internet. But the mixed approach has not always worked so far. For example, Barnesandnoble.com, either despite or because of being set up as a different company, has had several clashes with its parent, and recently shed its chief executive. Toys "R" Us tried a joint venture

Amazon's amazing ambition

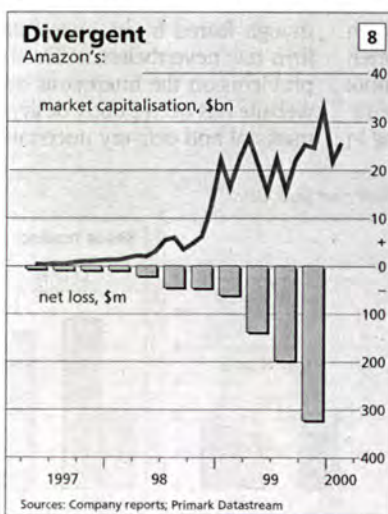
THE name has become synonymous with e-commerce (never mind that Jeff Bezos originally wanted to call his firm Abracadabra). Today Amazon is one of the few Internet brands recognised the world over. It is the most visited e-commerce website in America, and one of the top two or three in Britain, France, Germany and Japan. Now it is trying to stretch its brand, which to most people is linked to books, to cover anything that can be sold online.

At first glance, Amazon seems ill-suited to being the giant of the web. Its headquarters, an Art Deco building that once housed Seattle's Pacific Medical Center, is imposing, but the desks within are still made out of old doors. The staff are still a touch, well, geekish: after all, the firm is only four years old. And Amazon has often been quite cautious. It was only 18 months ago that it ventured beyond books to CDs and videos. David Risher, senior vice-president, smugly notes that: "Within four months of going into CDs, and within six weeks of going into videos, we were the top-selling sites for both products."

What is Amazon's appeal? It is seldom the cheapest place to shop on the web. Firms such as Buy.com have set up with the explicit promise of undercutting it. But thanks to its large investment in warehouse distribution centres, Amazon has the best reputation in the business for fulfilment and delivery. Its patented "one-click" technology makes shopping delightfully simple. And by

pioneering consumer reviews of books and other products, and using its database to make recommendations, it has built a sense of community among users: 66% of sales go to repeat customers.

No doubt other firms can and will imitate most of this (patenting one-click shopping seems as far-fetched as patenting wallets, and is under court attack). Yet Mr Bezos's bet is that his reputation for customer service, combined with first-mover advantage, will let him build an unassailable lead. Customer-acquisition costs, he believes, can only get higher. He talks of being the world's most "customer-centric" company, delivering from what it likes to call the "earth's biggest selection" of products.



Will it work? There is no denying Amazon's success so far, as it has expanded to greeting cards, toys and gifts. It has made useful small investments in other firms, including drugstore.com, homeGrocer.com, an online grocer, Gear.com, a sporting-goods seller, and Pets.com, a pet-supplies firm. It has launched an auction site and, most recently, its zShops, a portal-cum-marketplace that other online sellers use to hawk their wares.

And yet none of this quite adds up to becoming the Wal-Mart of the web, for two reasons. First, Wal-Mart's true strength has been its ability to squeeze suppliers. It is hard to associate Mr Bezos's firm with similar ruthlessness.

More important, Amazon seems to suffer more than any other firm in e-commerce from a congenital lack of profitability (see chart 8). This year may be marking the end of the stockmarket's infatuation with dot.coms, especially in the business-to-consumer field. Amazon's announcement of record losses in the fourth quarter of 1999 was softened by the claim that it was at last making profits on books alone—perhaps vindicating its view that losses taken to build market share can turn into profits later. But the firm has also, for the first time, shed staff. And the stockmarkets are increasingly sceptical about it.

Amazon may still be one of the best-quality Internet retailers (and shares) around. But in the longer run its problems raise the all-important question for the industry: how long will investors in any firm that sells on the web be ready to wait for profits?

with Benchmark Capital that fell apart over policy differences after a few months. It too has lost several top managers. It has also failed, despite determined efforts, to oust eToys as the top online toy retailer.

So who, if not the Arkansan firm itself, will emerge as the Wal-Mart of the web? As it happens, there is at least one strong and well-established pretender to the title: Amazon. For Amazon has chosen to test the inherent "scalability" of the Internet by expanding well beyond its starting point of book-selling. Indeed Jeff Bezos, Amazon's cheery founder and boss, has said at various times that he is willing to sell anything except cement, or simply that he is willing to sell anything (see box on previous page). But in saying this, he raises a big question: does web retailing favour generalists or specialists?

Webmaster or web servant

In favour of the generalists—the Wal-Marts of this world—is the web's scalability. Once you have invested enough in customer acquisition, by building a brand name and a reliable logistics and distribution system, the marginal cost of adding extra lines is tiny, and certainly much smaller than in the physical world. So in order to maximise revenues from those customers, you might as well sell them whatever you can. This, in essence, is what Amazon is now trying to do. If this line of thought were carried to its logical extreme, e-commerce would end up with a single retailer: Amazon as not so much the Wal-Mart as the Microsoft of the web.

Yet even though economies of scale and scope are greater on the Internet than in the physical world, this still seems highly implausible. Some features of the web point in the opposite direction: in favour of the specialist, or "category killer". If you can create the best website for selling Pokemons, for instance, the Internet's scalability could allow you to capture this niche all over the world. Numerous specialist websites have indeed established powerful niches. Ehobbies.com, based in Los Angeles, has established itself in the niche of collectibles such as model trains or cars. Garden.com has grabbed much of the gardening space. EToys regards the children's market as its oyster.

So which model will win out? There is probably room both for some specialist category killers that identify and conquer specific markets, and for a few large generalists that cover a broader front. But the pickings for anybody positioned in-between, on the model of a classic department store such as Macy's or Bloomingdale's, are likely to be thin. And the



Bezos will sell anything

web's economics also suggest that, within each defined market segment—whether for beanie babies, books or beauty products—there may eventually be room for just one or two e-commerce firms.

Over the coming years, therefore, web retailers whose business models are insufficiently different from better-established rivals will be winnowed out. The process has started as the industry concentrates. As much as 75% of business-to-consumer e-commerce is now done through five sites: Amazon, eBay, AOL, Yahoo! and Buy.com. Two web retailers, Beyond.com and ValueAmerica.com, have sharply cut back operations. Some new entrants to the game, who failed to make enough impact in the holiday season, may pull out altogether. Even established firms such as eToys have seen their shares tumble precipitously this year.

The capital markets may not be voting for the success of traditional retailers in e-commerce; but they are raising doubts over the survival prospects of many business-to-consumer pure plays. And it is not just the obvious things such as price, choice, website design or marketing that such firms need to get right. At least as important, e-commerce ventures must pay more attention to what has often proved their weakest spot: fulfilment and distribution.



Distribution dilemmas

WHAT might a Martian looking at America pick out as the clearest physical indicators of an e-commerce revolution? Those millions of PC users clicking away at their desks might well be buying things over the Internet, but then again they might be sending e-mails to their best friend, or looking at rude pictures. No, the most tell-tale signs that e-commerce has taken off are hundreds of huge new automated warehouses and thousands of vans delivering little packets to households: in short, the fulfilment and distribution end of the Internet revolution.

And, as so often with an unglamorous back-office business, it is this end of e-commerce that has proved the most troublesome.

Indeed, the late-1999 holiday season will probably be remembered not so much for the huge explosion in Internet retail sales as for its terrible tales of delivery snarl-ups. Toys "R" Us and Wal-Mart announced as early as the second week of December that they could no longer guarantee delivery of

Can the web merchants deliver the goods?



website orders by Christmas. Consumers started to scream when they found they were unable to cancel or amend orders; many made it clear that they would have liked some real live human contact to sort things out. Some observers thought things were so bad that frustrated customers might abandon their efforts to shop on the web, and that e-commerce, instead of growing by leaps and bounds, might start sliding downhill from now on. They may be overreacting, but it seems certain that one thing that will count a lot in the coming e-commerce shake-out will be fulfilment, not price.

The early e-commerce pioneers concentrated on the end of the action that they reckoned to understand: website design and snazzy marketing. Many outsourced the whole tiresome business of order checking and distribution. In its early days, even Amazon relied wholly on Ingram's book-wholesaling operation. Consumer-electronics sites left the business to Micro, another big wholesaler and distributor. Everybody used United Parcel Services (ups), Federal Express or the post for delivery.

Yet two things soon became clear. One was that shipping costs were (and remain) one of the biggest deterrents for consumers considering online purchases of physical products. The second was that traditional warehouse and distribution centres were not well suited to the business of e-commerce fulfilment: if it is to work properly, it needs newly designed systems. Both these things have combined to undermine some of the economic advantages of online shopping.

Perhaps this should not have come as a surprise. Physical shoppers, after all, handle their own order fulfilment, by choosing the goods and paying for them at the check-out, as well as their own delivery, by personally taking them home. And they do all this at their own expense, in both time and money. Merely to replicate this system efficiently, down to the individual consumer, is demanding enough; financing it, whether by absorbing the cost or by adding it to the bill, makes it even harder. It might have been better had e-commerce firms given more attention to this end of their business first.

Ironically, the delivery problems encountered by pure plays were one of the things that led many traditional retailers to assume that they could do better. Ironically because, here as elsewhere, many quickly found that their own distribution systems, geared to moving goods on pallets from warehouses to shops, proved a disadvantage, not a benefit. Wal-Mart, for example, has the most highly praised distribution system in the world: even the tyre pressures of its lorries are calibrated so that, when fully laden with pallets, the vehicles will be at exactly the right height for the unloading docks at Wal-Mart stores. But such a system is unable to cope with individual orders that have to be delivered to people's homes. So Wal-Mart has had to outsource its website distribution to two rivals: Fingerhut, a distributor that now belongs to Federated Department Stores, and Books-a-million. EToys, the biggest online toy retailer, has also used Fingerhut.

Catalogue retailers, such as Land's End and J. Crew, are a different matter. Their warehouses were already aimed at delivering individual orders to people's homes. Adapting their order-taking to the web has not been simple, but distribution has cer-



If only they could digitise the lot

tainly been far easier than building new warehouses from scratch. This remains the biggest reason for expecting the catalogue businesses to emerge as a success story of the web.

For the rest, is outsourcing the answer? Sometimes it can be. It certainly seems to work for long-distance deliveries by road. ups has been one of the biggest beneficiaries of the e-commerce boom: it reckons to handle around two-thirds of all goods ordered online. It has also developed a sophisticated (and very popular) website-cum-tracking service that allows consumers to check exactly where their order is at any time of the day or night. It has edged out its biggest rival, Fedex, which realised too late that its main business, document delivery, was being disintermediated by e-mail.

But although actual delivery can be outsourced, many e-commerce firms are finding that it is risky to do the same with picking and packing, because a contractor working for many web merchants will never be able to give all of them priority, especially when the pressure is on during the holiday season. So more and more e-merchants have decided to follow the example of Amazon and build their own giant automated warehouses around the country. Amazon is building seven; eToys so far has just one; Webvan, an online grocery store, has plans for 21. Along with ups, winners from e-commerce now include firms such as AMB Property of San Francisco, which is handling the choice of sites for Webvan's warehouses, and Bechtel, which is building them.

The supermarket on the web

Logistics and delivery are also key to understanding the nascent online grocery business. So far, this is small and, like the physical supermarket business, highly localised. Netgrocer.com distributes only dry groceries all over America; Peapod.com, the first to be established, offers all types of groceries, but covers only 8% of America's population, and has only just begun to build its own warehouses (so far, it has



The future of shopping?



book" that allows you to download new books at the click of a button; improvements in home printing and binding may one day make electronic distribution the preferred way to sell books.

The music business is already heading towards e-distribution, and is in turmoil as a result. Last year a new release from Public Enemy became the first commercial piece of music to be distributed over the Internet before appearing in the record shops. The spread of the MP3 digital music format has put fear into the hearts of record-industry executives, because it seems to hold out the possibility of people making an infinite number of perfect (albeit illegal) copies of any music that is ever put out on the web. They have responded with floods of lawsuits, and have launched a "secure digital music initiative" (SDMI) to stop the pirating; but so far there has been little sign of agreement. Broadly speaking, most people in the industry have treated the Internet as a threat, not an opportunity.

Al Teller, president of Los Angeles-based Atomicpop.com, which released the Public Enemy number, thinks this is misconceived. He has little sympathy for the traditionalists, even though he himself, as president of CBS records, used to be one. He recognised the scope for digital downloading several years ago, and tried to persuade the industry to embrace it. Having failed, he set up Atomicpop instead. His vision of the future is radical: "The only

permanent bits of this industry are the people who make the music, and the people who buy it." But it is also expansive, for he sees the web as a way greatly to enlarge the market for music.

Does that mean there is no future for the record labels, and that artists will release music straight over the Internet? No, says Mr Teller, because the web needs filtering, editing, marketing and promoting even more than the physical world. But he thinks the labels need to restructure themselves from top to bottom: it is not enough to treat the Internet as just one more distribution channel. If they fail to adapt, labels like his stand ready to take over, along with a new infrastructure of portable music players, listener-driven music reviews—and artists keen to escape the record companies' clutches.

What about copyright? Mr Teller strongly supports it. In a digital world, he says, it should not be too hard to find a way of protecting copyright, even if the SDMI proves not to be the way to do it. One firm that may offer a better solution to digital-rights management on the web is itself a member of the SDMI: InterTrust, based in Santa Clara, California. It has devised what Victor Shear, its chairman, calls a "meta-utility": a platform for the conduct of digital e-commerce that protects copyright and deals with payments at the same time.

To use the InterTrust model, a record company (or, indeed, anybody who has digital content) gets it packaged into an encrypted file known as a "Digi-box", which comes complete with rules about use, access and payment methods. These can be as flexible as the content provider wants to make them: three free plays followed by a charge, say, or a fixed price for the whole thing, or a system that charges a small amount for every replay.

Mr Shear's outfit is not the only one trying to make such a thing: Liquid Audio, Xerox, even Microsoft are devising their own digital-rights management systems. But InterTrust has the most advanced and capable technology, protected by at least 12 patents. It has the backing of Universal Music and Bertelsmann; PricewaterhouseCoopers, the world's biggest consulting firm, has just signed on to use the technology for its clients. InterTrust's may indeed become the main operating system for the new market, and could yet come to govern the distribution of all digital content over the web, whether it be films, news or books. So has Mr Shear heard from the Justice Department? Not yet, he responds evenly.

In the great web bazaar

Everything has its price. The web can help you find out what it is

THE real revolution in e-commerce may lie in something not immediately obvious. Never mind the new retailers, the lower prices, or huge changes in logistics and delivery. What is truly new about the Internet is its ability to generate different pricing mechanisms, and in particular to allow price and product comparisons to be made and various kinds of auctions and exchanges to take place.

Two things are making these possible. One is that the Internet provides a perfect medium for aggregating buyers and sellers from all around the world. If you are a collector of beanie babies, in the

physical world you would have to spend a lot of time and effort to draw together all your fellow enthusiasts; online you can do it effortlessly. The second is that the Internet offers an excellent way of comparing prices and collecting information, for example on new products, or on recent bids. Once again, to replicate this offline would be costly and time-consuming.

Price and product comparisons have been made easier by the development of "shopping bots". Websites such as Mysimon.com and DealPilot.com enable buyers quickly to compare products, prices and

availability. For cheap items such as toothpaste or lettuce, most web users may not want to bother, any more than real-world shoppers do. It is also noticeable that, at present, the cheapest providers on the web are not always the most popular; and that, conversely, higher prices do not necessarily put customers off. But as e-commerce grows, and as people start to use it more to buy such bigger-ticket items as cars and white goods, the role of comparison-shopping agents could become far more significant.

Price it and see

The technology is improving fast, and so is the choice of agents. Both DealPilot.com, a German company, and RuSure.com, based in Israel, equip users with a piece of software that automatically informs them of the best available prices on the products they are looking for. If you have the software and are about to buy a book from Amazon, say, a box will pop up to tell you that you could get it cheaper elsewhere. As consumers get used to this idea, price competition on the web, which has so far been less energetic than expected, may intensify.

Shopping agents also judge how well a product does its job. Frictionless.com, of Cambridge, Massachusetts, offers the electronic equivalent of a well-informed shop assistant. Buyers of electrical goods, for instance, can use the technology to rank products by performance on criteria of their choice—weighing ease of use, say, against quality of service. Only once the product has been chosen do criteria such as price and availability come into play. This model can be applied to any number of products: recently, Frictionless teamed up with Wingspanbank.com, an online banking subsidiary of Bank One, to help consumers choose mutual funds.

A plethora of other agents that help consumers, all offering slightly different services, is now vying for attention. From New York, Brandwise.com offers product reviews and price information about white goods and electrical appliances. Epinions.com, based in Silicon Valley, has chosen what its boss, Naval Ravikant, calls an “open-source” style of review for products of all kinds, with visitors providing all the material. The company makes no attempt to edit any of this, but once posted, the reviews themselves are rated by other users. Listen.com, also in San Francisco, is using a similar idea to build a directory of music on the web, complete with reviews written initially by its own reviewers, but incorporating the comments of visitors to its website as well.

Then there are the intermediaries that specialise in ranking other websites. Gomez Advisors, in Massachusetts, assesses the performance of e-commerce websites in areas such as personal finance, travel, shopping, car buying and auctions. For each of them it offers a table of rankings based on marks out of ten. Rivals include Yahoo!, the biggest Internet portal, which offers its own frequently updated guides to the best websites around. AOL, the biggest Internet service provider, also helps to guide customers around the shops.

If it seems hard for anyone to make himself heard amid this cacophony, that is largely because e-commerce is at such an early stage of development. The shopping agents and rating sites will themselves no doubt be ranked in due course, and their numbers are bound to come down. But one big

question they will all have to answer is: which side of the transaction are they on?

The same question applies to another new band of intermediaries: those that are running auctions and other price-discovery mechanisms. The arrival of the Internet auction is one of the biggest things that has happened in e-commerce—as some of the crazier stockmarket valuations attest. EBay, the biggest single consumer-to-consumer auction-site, is worth 20 times as much as Sotheby's (in which Amazon, which runs its own auctions, recently bought a stake). By market capitalisation, Priceline.com, which runs reverse auctions for airline tickets and a few other things (including groceries), is worth as much as American Airlines.

The power of auction sites, says eBay's Pierre Omidyar, lies in their strong “network effects”: the more people that use them, the more useful they are. That also confers a potentially bigger first-mover advantage on auction sites than on electronic retailers—an advantage eBay is so bent on preserving that it has triggered antitrust inquiries into its efforts to stop rivals logging into its site for price and bidding data. EBay has nearly 10m registered users bidding for some 3m items. Each user spends nearly two hours a month on the site, a lot more than Amazon's equally loyal clientele. And eBay's charges are typically no more than 7.5%, compared with over 25% for offline auctioneers. Mr Omidyar also takes pleasure in pointing out that eBay is almost the only pure-play e-commerce firm that has been consistently profitable from the beginning. No wonder auction-houses and flea-market operators fret that they may soon lose much of their business.

Monetising the audience

Nor is eBay the only threat. Amazon and Yahoo! run their own auction businesses. Jerry Kaplan, who started Onsale, the first B2C auction site (before eBay), which dealt mainly in surplus computers, has subsumed it into Egghead, a big retail site for computer hardware and software that also does auctions. He claims the most loyal consumers on the web. And it is not just a matter of sales; as he points out, there are “multiple ways of monetising the audience besides selling stuff”, a claim confirmed by



Now all the world can be a bidder



An early price-discovery mechanism

Egghead's high number of repeat customers.

Even Priceline is only the best-known of several reverse-auction sites. Under its (patented) model, bidders name their prices for a flight and leave them on the table for airlines to accept or reject them. Jay Walker, the firm's founder, claims the model has been so successful that he is now the largest seller of leisure air tickets in America, with 3m customers. He dismisses critics who say that few of their bids (under 5%, according to some) are fulfilled, and that many consumers dislike the rules preventing them from withdrawing their bid or from putting in a fresh bid. He says these grouses come "from university professors, not from our customers." Priceline is now expanding its model from air tickets and hotels to cars and groceries, for which it claims to be able to deliver savings of as much as 50%.

Yet Priceline falls far short of a perfect consumer-auction model. Many people wonder if it is really working mainly for the benefit of the consumer, or mainly for the airlines; its refusal to publish price information certainly leaves some doubt. A purer model is offered by NexTag.com, an auction site that at present deals primarily in new computers and consumer electronics but has plans for much bigger things. Purnendu Ojha, its co-founder and boss, describes NexTag's goal as nothing less than eliminating the "deadweight loss in the supply/demand curves caused by fixed pricing."

The model that Mr Ojha cites is the stockmarket, in which supply and demand are continuously adjusting to each other throughout the day. Buyers on NexTag submit bids, but can then change them; sellers can accept or reject them, or even counterbid. This is not so much a reverse auction as a continuous buy-and-sell auction that avoids the delays built into eBay and Onsale and the inflexibility and secrecy of Priceline. The effect is to turn the market for, say, Palm Pilots into the equivalent of the Nasdaq stock exchange. Now another new firm, Perfect.com, is trying to go one better by adding such dimensions as delivery and customer service to the continuous auction.

Yet another auction-style model is employed by aggregators such as Accompany.com or Mercata.com. These websites seek to gather together the buying power of consumers to achieve the best pos-

sible prices. As more bidders join in, the price of whatever they are after will tend to drop. Jim Rose, chief executive of Accompany, describes his site as offering "many-to-many" trading (as opposed to eBay's one-to-one or Nextag's one-to-many). It is especially useful for people who have time to wait for an item but are highly price-sensitive.

All the world's an exchange

Any believer in Adam Smith's ideas must welcome this kaleidoscope of different trading models. In some ways, the notion of fixed prices is itself relatively recent. Until, say, 200 years ago, most trading took place in open marketplaces or bazaars, in which prices moved continuously and it was easy to check up on competitors. Now the Internet seems to be creating the possibility of a permanent worldwide bazaar in which no prices are ever fixed for long, all information is instantly available, and buyers and sellers spend their lives haggling to try to get the best deals.

Of course it will not happen like this. The popularity of Internet auctions and other buying techniques such as aggregation owes a lot to their novelty effect: they are not so much a new marketplace as a new form of entertainment, the appeal of which could easily wear off. Auctions are better suited to some items than to others. Fixed prices did not develop by chance; for many products they suit both buyers and sellers. A shopper anxious to get through the weekly grocery list will have little appetite for bargaining over every item.

Yet despite these reservations, the new pricing models will not disappear. More likely, they will be used for goods and services where they work well—new computers, cars much in demand, anything second-hand, airline seats and other travel services. And as consumers get used to auctions as a way of buying travel or computers, say, they may be readier to try them out for other goods and services, such as buying and selling property or catering for a party.

But the intermediaries will still have to answer the same old question: whose side are they on? John Hagel's infomediaries and Philip Evans's navigators around the web act as agents for the consumer. The best Internet portals, aggregators and auction-sites will have to do this too. In the physical world similar questions can be fudged: an auctioneer works for both seller and buyer, a travel agent tries to get the best deal for both sides. But in the online world, where any transaction can be unbundled and any intermediary disintermediated, such ambiguity may not be sustainable. The best indicator will often be payment or ownership: that Brandwise, the reviewer of white goods, was set up by Whirlpool, a manufacturer, arouses immediate suspicions. Once profits start to be made on the web, it will always be worth asking an intermediary: who pays you?

It is worth noting, too, that auctions and aggregators, like the Internet itself, are inherently global in scale. Indeed, to make the most of network effects, they need to operate worldwide. However, this raises an unexpected difficulty, given America's lead in the Internet: in Europe, at least, rivals are already at work. Hence the next big question in e-commerce: will it spawn global merchants, most of which are likely to be American?



First America, then the world

SOMETHING like three-quarters of all e-commerce currently takes place in the United States. The country also accounts for 90% of commercial websites. Given that the Internet is, by its very nature, global in reach, these two facts raise a vital question about e-commerce for the rest of the world: is America in general, and are American websites in particular, inevitably going to dominate it?

The answer is not immediately obvious, for several reasons. For a start, it is surprisingly hard to cross borders in the retail world. In industries such as drink manufacturing, car making or investment banking, it is comparatively easy for a Coca-Cola, a Ford or a Goldman Sachs to establish itself around the globe. But in shopping or retail banking, cultural, linguistic and regulatory barriers often get in the way. Intriguingly, the physical world may be about to see some of these barriers surmounted for the first time: Citibank is on the way to becoming a global retail bank, and Wal-Mart is doing its best to turn itself into a global retail giant.

Surely the Internet will give such aspirants a further boost? It may well do so; but that does not mean going global will suddenly become straightforward. One big reason is the crucial importance of fulfilment and delivery. Being good at these inside the United States is clearly a plus, but, because they are by definition local, that does not guarantee success in other markets. Several American websites no longer take orders from outside the country for this reason (although Amazon reckons that as many as a quarter of visitors to Amazon.com live abroad). And in Europe, the biggest marketplace for e-commerce after America, a clutch of perceived or real government, tax and regulatory obstacles are deterring would-be American electronic vendors.

The third reason that American global domination should not be taken for granted is that many American web retailers may have left it too late: a surprising amount of e-commerce is starting to take place in other countries. In most Scandinavian countries Internet penetration is now higher than in the United States, and in Britain and Germany it is catching up. According to a new study by the Boston Consulting Group, retail sales on the web in Europe in 1999 were worth \$3.6 billion, and may rise to \$9 billion this year. Asia too is taking to the web: BCG predicts sales of \$6 billion there this year, with Japan, Australia and South Korea in the lead. Japan's huge Seven-Eleven retail chain has just unveiled ambitious plans for a leap into e-commerce, with consumers placing their orders over the web and collecting them at their local store on the way home.

To be sure, in some ways Europe and Asia are at a disadvantage compared with America. Credit cards are far less widely used, which is one reason for the success of mixing online (to place orders) and offline (to pay and pick them up) business. Another problem is telecoms costs. In Europe these can be five times as high as in America, where local calls are often free. Despite the success of "free" Internet service providers in Europe, BCG reckons it still costs twice as much there as in America to surf the web.

Yet in telecoms both Europe and Japan could now find themselves at an advantage, thanks to their lead over America in mobile telephony. Those with a stake in the PC business, such as Michael Dell, like to argue that nobody wants to surf the web on a one-inch screen. But it seems more likely that mobile telephones and other handheld devices are about to become the instrument of choice for Internet access. Brent Hoberman, one of the founders of Lastminute.com, a London-based website dealing in travel, entertainment and gifts, argues this will mean that "Europe can join at the next level up."

Europe gets wired

There are also plenty of non-American, and especially European, websites around (see chart 9). Mr Hoberman's firm is just one of the hundreds of e-commerce ventures that have started up all over Europe in the past year or so. Stockholm and London now seem to be in the grip of the sort of Internet fever that hit California two or three years ago, with a slew of billboard and bus advertisements, a bubbling new venture-capital industry, and hysterical stockmarket trading of newly floated companies. One such firm, QXL.com, has established a string of auction sites across Europe that are specifically designed to cope with different languages and currencies. When eBay first tried to launch around Europe in dollars only, QXL left it flat on its face. The proportion of eBay's customers outside America is still under 3%, but the online auctioneer is trying to boost these numbers with its recent purchase of a big Ger-

But before e-commerce can go global, it needs to overcome a few tiresome obstacles

Network effect

Internet hosts per '000 inhabitants, July 1999



Sources: OECD; Internet Software Consortium

*(.uk, .de, etc.) †(.com, .org, etc.)





man online auctioneer, Alando.de.

Some European firms even claim to be ready to take on the Americans at home. Letsbuyit.com is an aggregator that started in Sweden but has big ambitions: not only to launch all over Europe, but also to compete against Mercata and Accompany in America. Another firm with Swedish origins, but a base in London, is Boo.com, an ambitious sports-good retail website that spent a fortune on marketing its global launch in 18 countries round the world last November before it had sold a single sweatshirt. But Boo.com has run into problems; recently it sacked some of its excess staff.

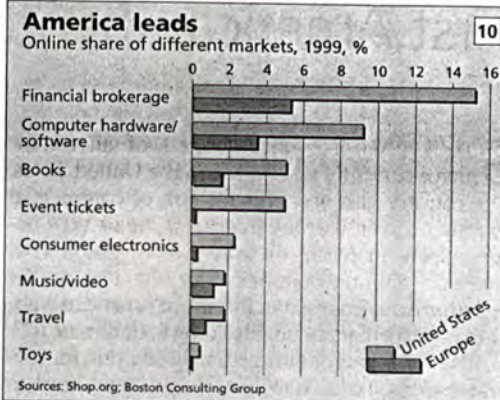
Physical European firms are also exploiting the web, though not without the usual teething troubles. MeritaNordbanken, a Finnish-Swedish bank, says that 50% of its retail customers now bank online; Sweden's SE bank claims 25%. These are far higher penetration rates than any bank has achieved in America. Tesco Direct, the online grocery service of Britain's biggest supermarket chain, is being derided for its dismal performance—but it has ambitious expansion plans. The airlines too have taken to the Internet: Easyjet and Go, two low-budget British carriers, claim to be selling 60% and 50% respectively of all their tickets online.

One European country, France, even claims to have been the global leader in e-commerce long before America ever woke up to it. In 1994, 1.2m French people bought something electronically, whereas fewer than 800,000 Americans did. The difference was that the Americans used the Internet but the French used Minitel, a proprietary network set up and operated by France Telecom.

The contrast between the two is instructive. The Internet grew up in an anarchic manner, with commerce tacked on as an afterthought, whereas the Minitel was built and run by the government on special terminals owned by France Telecom. That may have helped to boost e-commerce in France in its early stages, but it soon became clear that the Minitel was being used for buying train tickets but little else. It did not have an e-mail facility, because that would have put it in direct competition with the state-owned post office. Now Minitel use is declining as the Internet takes over. Last year commerce on Minitel actually shrank, but on the web it tripled (from a smaller base). France Telecom is about to relaunch the business in a form that combines the Minitel with the Internet. Even so, the French prime minister, Lionel Jospin, has conceded that the Minitel experiment may have slowed down France's move into the Internet age.

Yet despite this particular local difficulty, the scope for the Internet to shake up retailing in Europe ought to be huge. In almost every country the existing marketplace is vulnerable. Property prices, planning restrictions, regulations about advertising and rules on opening hours all conspire to make shopping in Europe less efficient than in America. So the gains from the Internet—and the profits for those American websites that can successfully make the transition—should be that much bigger if the web is allowed to work its magic.

Most American e-commerce firms say they are too busy at home to contemplate expansion in Europe yet, even though they already have about a fifth of the market there, often through their domes-



tic operations. But in truth they may be bothered about something quite different: government. The popular view in Silicon Valley is that government should be kept out of the nascent world of e-commerce, lest it strangle the baby at birth. And the geeks are convinced that government in Europe, which they believe regulates anything that moves, poses an even greater danger to the infant than in America.

Who needs government anyway?

Clearly this view is a huge oversimplification. The American government has in fact given a big push to e-commerce, in two ways. One is by permitting the patenting, sometimes on fairly shaky ground, of a host of business processes, so that no self-respecting e-commerce firm is now without its in-house patent lawyer. The second and even more significant one is by imposing a moratorium on new taxes on anything bought over the web. Web purchases are also generally exempt from sales taxes: so long as a website operator has no physical presence in a state, it can avoid collecting sales tax on any goods sold in that state.

However, the tax debate is coming to a head as e-commerce grows. One reason is that the American states are becoming increasingly worried about the sales-tax exemption, because that tax is often their biggest source of revenue. Ernst & Young reckon that last year Internet business caused the states to lose \$170m in tax revenue. Another reason is energetic lobbying by physical retailers, who reckon they are being put at a disadvantage by the pure plays' ability to escape tax. A congressional advisory committee is at work to consider the issue, but there seems no easy solution in sight. Internet consumers and websites will fiercely resist imposition of the sales tax—after all, catalogue retailers have avoided it for decades. Instead, they suggest abolishing the sales tax altogether, pointing to the jungle of America's 30,000 individual tax jurisdictions.

But the tax debate is not just about what happens inside America. Tax is also an international issue, and happens to be one of many relating to e-commerce that is being examined by the OECD, the rich countries' think-tank in Paris. If American Internet addicts hope they may be able to avoid taxes for ever, a visit to the OECD will soon persuade them otherwise. In several EU countries the rate of value-added tax (the nearest thing to American sales taxes) can be as high as 25%, and VAT accounts for an average of 40% of Europe's tax revenues. There is no

prospect that, once e-commerce takes off, goods or services sold over the Internet will be allowed to avoid such an important tax. As it happens, even the Americans have accepted (at a meeting in Ottawa last year) the principle that tax should be levied on goods sold electronically, at the rate prevailing in the country where the consumer is based.

But it is regulation, rather than tax, that American e-commerce firms are most concerned about when they contemplate Europe. Much is made of a small number of unhelpful recent cases. In one, Compuserve, an online consumer network, temporarily had to close down its operation in Germany after a Bavarian court found it liable for the content of race-baiting material on a website over which Compuserve had no control. In another case, Land's End, a clothes retailer, was deemed to be breaching German consumer law by offering its normal 100% replacement guarantee for any clothing that wore out. Advertising on websites in Europe is a colossal headache: for example, Denmark bans advertising to children, France bans advertising in English and Germany bans comparative advertising.

An even fiercer argument is raging about privacy and data protection. The European Union has adopted a directive that, if implemented, would prevent the transfer of data about consumers to third countries where the level of data protection is, in the EU's terms, "inadequate". Because American data protection is non-statutory and there is no government data-protection office, it is regarded as inadequate by definition.

Yet blocking the transfer of business data to America is widely regarded to be all but unthinkable. For the past two years, the two sides have been trying to find a compromise, with the Europeans carefully holding back from sanctions but keeping the threat in reserve. Meanwhile, concerns over privacy are starting to grow in America itself, encouraging both government and business to concede some ground to the EU. Now a solution is in the air: the Americans are offering to endorse a "safe harbour" principle, whereby companies within the safe harbour undertake to apply standards of privacy protection equivalent to those in the EU. In return, they will be allowed to collect data unimpeded. The deal may be struck at the next summit between America and the EU in March.

The Europeans are showing surprising flexibility not just over data protection but over e-commerce in general, because they too are anxious to secure its benefits. The Americans have followed with keen interest (and may even learn from) the legislative framework that the EU is trying to put in place this year to govern such matters as electronic signatures and copyright. Another example of European flexibility is forthcoming legislation to apply a convention that governs the jurisdiction for consumer disputes. At one point, this legislation had been drafted in such a way that it would have permitted a consumer to sue any website operator in the consumer's home jurisdiction, even if the website never intended to sell anything there. Under pressure from the industry, that now looks like being changed to allow a website to specify the jurisdiction in the event of any lawsuit.

Still, too many governments and regulators, especially in Europe and Asia, are frightened by the

Internet, which they consider subversive, as well as too American. They see it as undermining consumer protection, jeopardising taxes and risking even more inequality. In places such as Malaysia—to say nothing of China—the Internet is deeply mistrusted because it seems to threaten government control. Yet although these fears may have some basis in reality, governments would be well advised to find ways of assuaging them that stop short of shunning the Internet altogether. They are likely to find it impossible to ban the web anyway, because it has already spread too far. Mr Dell notes that 40% of orders for his computers in China are now placed online.

Unprotected, unwired

It is true that consumer protection may be harder to enforce in a world where Internet gambling sites operate out of Gibraltar, porn rings are run out of the Caribbean and American patients are already using the web to buy drugs in Mexico that have not been approved by the Food and Drug Administration. But the web does offer both regulators and taxmen other advantages, such as a perfect audit trail. Tax-



What I need is a laptop

ation will even so be a continuing problem, especially on activities such as gambling that can take place overseas and in digital form. But for many other goods, it should be technically quite possible to find a way to collect taxes on Internet commerce.

What should perhaps be a bigger concern is inequality, or what is often called "the digital divide". Electronic commerce holds out the promise of greater efficiency and transparency, and of lower prices, all of which would be as welcome in Europe and Japan as in America (and, indeed, poorer countries). Yet Internet usage is skewed towards the upper end of the income scale, so the first to reap these benefits will be the better-off. Some way needs to be found to spread them to people on lower incomes—for instance, by putting terminals in public libraries and schools, and by teaching every schoolchild how to use a computer—and also to poorer countries. Inequality within and between countries is certainly not the fault of the Internet. And the web is by its nature democratic, open and transparent; if its benefits are spread wide enough, it might, in the long run, actually help to reduce rather than increase inequality.

We're off to the online mall

Retailers must change—or bite the dust

THE scene is San Francisco, the date December 2010. In Union Square a few grubby discount stores are open for (thin) trade, but all around them are whole streets of boarded-up shopfronts. There are few pedestrians about, but plenty of delivery vans. In homes and offices all around town, people are staring at their computer screens and chattering into their mobile phones.

Consider Ms E. Consumer, a 45-year-old mother-of-three who works for a public-relations firm. On her screen is a score of messages reminding her exactly what she bought for her three children, her partner (husbands went out in 2005) and her 20-odd relations over the past five years. Each message comes with a suggestion for a gift this year. A few clicks, and she has verified that nobody else is giving the same things. She looks up the lowest prices and best delivery schedules and orders the whole lot in ten minutes. Then she visits the exchange to check the price of the latest WAP-enabled mobile TV-cum-telephone and revises down her \$30 bid of yesterday to \$25. Before leaving the office she calls up her standing grocery order and adds a dozen oysters and a bottle of champagne. They are waiting for her when she arrives home 45 minutes later. There she uses her mobile phone to order the latest movie and a few tracks from a new music release to listen to while her partner prepares dinner.

Implausible? Worrying? Only five years ago, in the pre-Amazon era, almost nothing was bought online. But extrapolate the past five years' growth, and it is easy to believe that by 2010 close to a fifth of American retail spending could be carried out over the Internet. And for things like books, music, films, toys, white goods and cars, the share seems likely to be much, much bigger.

And who will be handling this business? No doubt there will be many names that are already familiar today. Some may be existing retailers such as Barnes & Noble, Macy's and Wal-Mart; some newer firms such as Amazon, eBay and eToys. But many shops will have become little more than showrooms

and places of entertainment, with the actual buying and selling going on elsewhere. There will be plenty of less familiar participants too: firms such as Next-Tag, Accompany, RuSure and Dealttime. The dot.com suffix will have been largely dropped; indeed, the distinction between buying online and offline is likely to disappear as the Internet becomes as ubiquitous as the telephone. And some old names will have disappeared too: perhaps Sears, Borders, Bloomingdale's, Toys "R" Us, Kmart.

A cautionary tale

Still convinced that nothing much is really going to change, or that e-commerce is a passing fad that will go away? Then listen to the sad story of one of the oldest and finest consumer products ever sold: a veritable fount of knowledge.

The notion of an encyclopedia was essentially a product of the Enlightenment. In France, Denis Diderot devoted a lifetime to producing one. But what was to become the most famous encyclopedia in the world started life in 1768, in Edinburgh, Scotland: the Encyclopaedia Britannica. As it went through successive editions, academics and ordinary readers alike came to rely on it; even today, some historians become misty-eyed when they talk of the great 11th edition, published in 1911.

The reputation of Encyclopaedia Britannica survived a change of ownership in 1920 to Sears Roebuck, an upstart mail-order retailer, and a move of its base to Chicago. Two decades later it became the property of a foundation, the proceeds of which benefited the University of Chicago. Its door-to-door salesmen became legendary for their knack of persuading parents that an encyclopedia was a must if their children were to grow up well-educated. By 1989, sales revenues had reached a record \$650m, and the firm's sales force had grown to 2,300.

Yet disaster was already waiting in the wings. It began when Microsoft produced a cheap CD-ROM encyclopedia called Encarta in 1993. Britannica's bosses responded with a CD-ROM of their own, but their salesmen rebelled at seeing their hard-cover books undercut (cannibalisation, followed by channel conflict). The Internet made things infinitely worse. Sales collapsed, along with the salesforce. In 1995 the company changed hands again, for a small fraction of its book value. Today it employs fewer than 350 people. Last October the new owner decided to make the contents of Encyclopaedia Britannica available free on the Internet, in the optimistic hope of recouping the cost through advertising on the website. But, as if to question even this new strategy, the site promptly crashed.

What lesson should be drawn from all this? The most pertinent one is this: if you are engaged in almost any form of commerce, from the humble market stall to the gigantic department store, the Internet is lurking, ready to blow up your business. And if you are not prepared to embrace change, to cannibalise your own sales and to disintermediate your own intermediaries, somebody else surely will.

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It's only a matter of time

Esther Will
1409 Delafield
Washington, D
Phone 202-29
FAX 202-291

Carolyn -

8 28 PM 3:32

Can we do -

his son is a dear friend.)

B

DATE:

TO:

Betty Currie

FAX:

456-1210

FROM:

Esther Williams Yarborough

PAGES:

Cover Only

RE:

Info on Carlton Smith's dad

Charlie E. Smith, 2021 N. Old Carriage Road, Rocky Mt., NC
27804. He was 80 years old on January 22, 2000. Carlton would like to know
if a congratulatory letter and an autographed photo be sent to his father.

Thank you for your assistance with this and for the scholarship infor.

Thank You --

2/28/00

Send to Burkhardt?

Yes



No

Photo as well.

Carl

Foran 14
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2/20

WHIT
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See Spake
to Vernon
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to this

Presi
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February 28, 2000

The Honorable Vernon E. Lazard Frères & Company
30 Rockefeller Plaza
New York, New York 10020

Dear Vernon:

Thanks for writing to recommend Reverend Gardner C. Taylor for the Presidential Medal of Freedom. I agree that he is a solid candidate, and it helps me to know of your strong support.

I hope all is well. Hillary and I send our best.

Sincerely,

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Dr. Taylor is recognized as one of the greatest preachers in our history. In 1980, Time Magazine called him "the Dean of the Nation's black preachers" and similar admiring assessments of his extraordinary pulpit abilities and his theological eminence have been made by civic and religious leaders of all races and denominations. He has served as a

*just signed
5/27/74*

*cc copy to
Sam interested
in doing this*

WHITE HOUSE
WASHINGTON

Brenda M. Fulkerson
Fulkerson & Company
124 West Capitol Avenue
Suite 1620
Little Rock, Arkansas 72201

Dear Brenda:

Thank you for your kind words about my State of the Union address.

Thanks also for telling me about the Fulbright College and AETN/PBS film project. It sounds wonderful, and I know Floyd must be very proud of his role in it.

I've passed along your request to the White House Social Office, which handles film screenings here. They'll be in touch with you if it is possible to arrange for this.

All the best to you and Floyd.

Sincerely,

Rm

*copied
C. Marshall
Scheduling*

Brenda M. Fulkerson
Fulkerson & Company
124 West Capitol Avenue
Suite 1620
Little Rock, Arkansas 72201



STATE OF THE UNION

ADDRESS TO THE 106th CONGRESS



SECOND SESSION

To Brenda Fulterson

with Maule

Bill Clinton

President William J. Clinton

JANUARY 27, 2000 • WASHINGTON, D.C.

Send
Sign
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South Square

celebrity
Pete Furr

also to Geo Rayner, Hope

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Hennrich
(pena file)
Frazier

WHITE HOUSE
HINGTON

February 23, 2000

Richard L. Barr
President
The Pasadena Civic Auditorium Foundation
300 East Green Street
Pasadena, California 91101-2399

Dear Richard:

Thank you for your thoughtful letter. It was good to meet you last month, and I appreciate all your kind words -- and the walk down memory lane.

Thanks again. Your support means a lot to me.

Sincerely,

Tru

I played on the
railroad underpass too,
the old one with the
tar-treated wood - Plus,
there's a new one there
now.

THE WHITE HOUSE
WASHINGTON

MEMORANDUM

To: _____

Date: _____

From: _____
Presidential Letters and Messages, 93 OEOB
Voice: (202) 456-
Fax: (202) 456-5426

☒ Please see comments
below

☐ Please advise on how
to respond

☐ Please call me
regarding the attached

☐ For your information

☐ For your approval

☐ Per your request

☐ No response necessary
for attached letter, unless
otherwise recommended

☐ For your agency's
response

Please respond by:

Comments:

Eugene -

Would you want to handle this letter &
send it to Mr. Barr's Att. for review?
If not, just send it to the White House
and I'll be happy to handle it.

Tracy



THE PASADENA CIVIC
AUDITORIUM FOUNDATION

Command the Best.

January 21, 2000

President Bill Clinton
The White House
Washington, D.C.

Board of Directors

Kathryn Nack, Chair

Dear President Clinton:

Alice Coulombe

I have just returned to my office from attending your excellent speech at Caltech and I appreciated the brief opportunity to shake your hand and mention our common bond with Hope, Arkansas.

Ann Hight

Adolfo Miralles

Joel Sheldon

Roger Smith

Charles Stanislawski

First, I want to thank you for that speech. While I am certainly not a scientist and have been involved with the performing arts as my career, I greatly appreciated your comments regarding man's inhumanity to man as the greatest challenge we face. I couldn't agree with you more and I thought that your (and Einstein's) challenging words to that audience were profound.

James Stivers

I was born on July 4, 1949 in Magnolia, Arkansas and spent my first ten or more summer vacations at my grandparents home at 312 North Hervey Street in Hope.

Dr. Vera Vignes

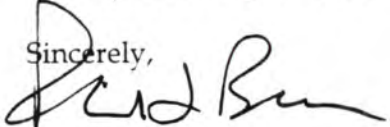
The house was built by my maternal grandfather, Arthur Hoge in 1912 and was the family home of my grandparents Harvey Betts Barr and Lola Hoge Barr for over 50 years. My father graduated from Hope High School and Arkansas College in Batesville and was a cousin to Vincent Foster, Jr.

Connie Johnson
CFO

Richard L. Barr
President

I have such fond early childhood memories of Hope including the railroad tracks and underpass, the A & P Grocery store near your home, the swimming pool at the Hope Municipal Park, and, of course Mr. Cole's ice cream parlor. I'm sure that our paths must have crossed during that innocent time in the early 1950's.

I have always supported you and your politics and I greatly appreciated your speech of this morning. I will be returning to Hope some time this Spring to lay to rest the ashes of my Aunt Carolyn who grew up in Hope and passed away this past fall. I'm sure that I will be reflecting on those early years that shaped both of us and reflecting on the bond that joins us all as humans. Thank you for your leadership of our country and I hope that we will meet again.

Sincerely,


Richard L. Barr

The mission of the Foundation is to create an exciting and energetic center for the arts by presenting the finest music, dance, theatrical, cultural and educational events and to preserve and enhance the historic Pasadena Civic Auditorium.

REMARKS BY THE PRESIDENT
AT MEMORIAL SERVICE FOR BOB SQUIER
National Cathedral
Washington, D.C.
February 4, 2000

Prudy, members of your family, all who were friends of Bob Squier. The Scripture summons us, "neglect not the gift that is in thee." Today we celebrate a man who did not neglect his gift, but instead shared it.

We have heard it in the stories of his sons, his partner, his friend. They have flooded our minds and hearts with memories of Bob Squier's passion for life, for his family, his work, for politics.

Vice President Gore and I, in particular, are the beneficiaries of that passion, and of his abundant American optimism. As has already been said, no matter how dark the night, Bob was always sure the sun would come up in the morning; and if it didn't, he would still find a way to get a tan. This sort of optimism was in rather short supply right after the elections in 1994, and most people thought that there were better investments in American politics than the reelection of Bill Clinton and Al Gore. Not Bob Squier. He saw it as sort of a minor challenge. He was there for us, and but for him, we might not be here today. There is something to be said for boundless optimism.

I think we ought to acknowledge, as has already been done, that this was a man whose passion for politics was part of a kaleidoscopic view of life and a wide range of interests. In addition to his documentaries about our great authors, he was also a pioneer in music television -- one of the youngest producers of the Boston Pops on PBS; the executive producer of the first live global satellite TV show featuring the Beatles. He even talked about working years ago with the Rolling Stones, which probably makes him the only person in his line of work in the entire world who could say that he worked with everyone from Keith Richards to Ann Richards.

Bob Squier was many things. They have all been described today -- a brilliant strategist, incisive commentator, trusted advisor, loyal friend. Above all, though, I think he was a storyteller. He knew how to tell a story, and he knew how to see the story that was unfolding right before our eyes.

He was very proud of his award-winning documentaries. He saw in the lives of Faulkner, Melville, Hemingway and Fitzgerald, and in their work, the story of America, just as surely as he saw it in the lives and campaigns of all of us in this hallowed cathedral today with whom he worked. He dug deep into their lives to tell us the story.

For all the politicians here, who ever agonized through one more take of a television ad, one more instruction about how this town hall meeting had to be dealt with, we're not surprised at the detail of his attention to his documentaries. He took F. Scott Fitzgerald's only daughter back to places she knew as a child and then interviewed her about her father. He took Robert Penn Warren to Shiloh to talk about Melville's Civil War poem about that battle. He interviewed Hemingway's son Jack as he cast flies in an Idaho trout stream. He even went to Havana and filmed in a boat piloted by Hemingway's former captain, who provided the inspiration for "The Old Man and the Sea."

That's the way he did his politics. It was never about the manipulation of words and images to put something over on the American people. It was always about finding the story, and trusting the people to get it right.

He told our story -- a couple of farmers in a field holding a sign that said, "Hope"; a widow placing a flag on a veteran's grave on a lonely hillside; a worker filled with the pride that comes from the dignity of a job; and as has been mentioned, the light in little Emma's eyes. He used them all to tell our story. Nobody did it better. He made policy understandable, politics exciting, and politicians human. He made the camera disappear.

Bob worked in a profession with one of the shortest half-lives in the world. But to paraphrase one of his heroes, William Faulkner, here in Washington he did not just endure; he prevailed, for over 30 years -- not just by putting a notch in the campaign victory belt, but putting into office candidates he knew shared his convictions and would fight his fights.

I have to say this on behalf of all of the elected and former elected officials here. There is one thing we all especially found endearing about Bob Squier. He actually liked politicians. And he wasn't ashamed to admit it, even in this age when a sort of sanctimonious disapproval of us is the only politically correct position. He saw people in politics as basically good people who struggled to reconcile personal conviction and popular opinion into a combined force that would lift our nation to higher ground.

Bob Squier's work lives on through all of us he lifted, through countless others he mentored and trained along the way. And so, the story of this great storyteller's life in a sense is still being written and will be for a long time to come.

In years to come, students of American politics will study Bob Squier's campaigns, Bob Squier's commercials, Bob Squier's commentaries. Students of our literature will study Bob Squier's documentary films. Those of us who shared this all-too-brief earthly journey with him, we'll be grateful for all that. But I suspect even more, we'll remember a dashing and handsome man with a killer smile, an acid wit, and goodness at the core -- a goodness that made even his adversaries like him.

We'll remember that behind the smile, visible in his eyes, was a steel will, a strong spirit, and a great heart that made our nation better, because it gave him the strength to nurture the gift that was in him, and to share it with us.

Well, Bob, we're giving you a good sendoff today. But not nearly as good as what you gave us. The last campaign is over. The polls are closed. The votes are counted. And you won. Big time. Now you're in a place with no talk shows, and no term limits. But your spirit will soar forever. Godspeed.

REMARKS BY THE PRESIDENT
AT SCIENCE AND TECHNOLOGY EVENT
California Institute of Technology
Pasadena, California
January 21, 2000

Thank you so much. Dr. Moore, President Baltimore; to the faculty and students at Cal Tech, and to people involved in NASA's JPL out here. I want to thank Representatives Dreier, Baca and Millender-McDonald for coming with me today, and for the work they do on your behalf back in Washington. I want to thank three members of our Science and Technology team for being here -- my Science Advisor Neal Lane; Dr. Rita Colwell, the NSF Director; and my good friend, the Secretary of Energy, Bill Richardson, who has done a great job with our national labs to keep them being innovators in fields from computational science to environmental technology.

One person who would have liked to have been here today and I can tell you thinks that he would be a better representative of our Administration on this topic is the Vice President. When we took office together, the fact that I was challenged scientifically and technologically was standing joke. And he wants all of you to know that he's campaigning all over the country with a Palm VII on his hip.

He wants you to know that he loves science and technology so much, he's not even angry that Cal Tech beat out Harvard for top spot in the U.S. News rankings this year. I think it has something to do with the relative electoral votes of California and Massachusetts.

Before I came out here, I told Dr. Moore and Dr. Baltimore that it was a real thrill for me to meet Dr. Moore, that even I knew what Moore's Law was, and that before the Vice President became otherwise occupied, we used to have weekly lunches and I'd talk to him about politics and he'd give me lectures about climate change.

We once got into this hilarious conversation about the practical applications of Moore's Law, like it explains why every cable network can double the number of talk shows every year that no one wants to listen to. So it's a real thrill for me to be here.

Actually, I come with some trepidation. An eight-year-old child met me at the airport. She and her brother came with their father, who is a friend of mine, and she brought me a letter from her third grade class. The letter had all these questions: What was your favorite book when you were in the third grade? What did you collect then? What do you collect now? One of the questions was, are you ever nervous when you're speaking before large audiences?

I was writing out the answers so we could type up a letter and I said, not usually. But I'm sort of nervous here today. I told one of the wags back at the White House with a sense of humor, that I was nervous and he said, well, you know the Einstein millennial story, don't you -- trying to help me get unnervous. I said, no -- you always learn to be patient in the face of other people's jokes. It's one of the great social skills an American can develop.

He said, well, God decides to give America a millennial gift, and the gift is to send Einstein back to Earth for a few days to talk to ordinary folks, because he was the greatest brain of the last millennium. And they have the first meeting in a nice little hall like this. It's absolutely packed, and these three big, burly guys push their way to the front, shoving everyone else to the side. So Einstein politely takes them first and he says to the first guy, well, what's your IQ, young man? And he said 240. He said wonderful, let's talk about how I thought up the theory of relativity. And they have a terrific conversation.

The second guy, he says, what's your IQ? He said, 140. He said, let's talk about globalization and its impact on climate change. And they had a terrific conversation. And the third guy kind of hung his head, and he said, what's your IQ? And he said, 40. And Einstein said, oh, don't worry. You can always go into politics.

I want you to know, though, in preparation for this day I've been spending a lot of time trying to get in touch with my inner nerd. My wife helped me, because she's been having these Millennium Lectures at the White House to discuss big things. And the other night, she had Vint Cerf, who was one of the founders of the Internet, and Eric Lander, who's helped to develop many of the tools of modern genome research. That really got me thinking, and I want to say some more serious things about it in a moment. And then my staff challenged me to actually

order Christmas gifts over the Internet. And I did that. And while doing that, I learned that with just a click of a mouse, I could actually order Arkansas smoked ham and sausage delivered to my door. So I think the 21st century has more for me than I had originally thought.

As all of you know, Albert Einstein spent a lot of time here at Cal Tech in the 1930s. And three weeks ago, Time Magazine crowned him the Person of the Century. The fact that he won this honor over people like Franklin Roosevelt and Mohandas Gandhi is not only an incredible testament to the quantum leaps in knowledge that he achieved for all humanity, but also for the 20th century's earth-shaking advances in science and technology.

Just as an aside, I'd like to say because we're here at Cal Tech, Einstein's contributions remind us of how greatly American science and technology and, therefore, American society have benefitted and continue to benefit from the extraordinary gifts of scientists and engineers who are born in other countries, and we should continue to welcome them to our shores.

The reason so many of you live, work and study here is that there are so many more questions yet to be answered: How does the brain actually produce the phenomenon of consciousness? How do we translate insights from neuroscience into more productive learning environments for all our children? Why do we age -- the question I ponder more and more these days. I looked at a picture of myself when I was inaugurated the first time the other day, and it scared me to death. And so I wonder, is this preprogrammed, or wear and tear? Are we alone in the universe? What causes gamma ray bursts? What makes up the missing mass of the universe? What's in those black holes, anyway? And maybe the biggest question of all: How in the wide world can you add \$3 billion in market capitalization simply by adding .com to the end of a name?

You will find the answers to the serious questions I posed and to many others. It was this brilliant Cal Tech community that first located genes on chromosomes and unlocked the secrets of chemical bonds and quarks. You were the propulsive force behind jet flight and built America's first satellites. You made it possible for us to manufacture microchips of ever-increasing complexity and gave us our first guided tour on the surface of Mars. With your new gravitational wave observatory, you will open an entirely new window on the mysteries of the universe, observing the propagating ripples which Einstein predicted 84 years ago.

Today, I came here to thank you for all you're doing to advance the march of human knowledge and to announce what we intend to do to accelerate that march by greatly increasing our national investments in science and technology.

The budget I will submit to Congress in just a few days will include a \$2.8 billion increase in our 21st century research fund. This will support a \$1 billion increase in biomedical research for the National Institutes of Health; \$675 million, which is double the previous largest dollar increase for the National Science Foundation in its entire 50-year history; and major funding increases in areas from information technology to space exploration to the development of cleaner sources of energy.

This budget makes research at our nation's universities a top priority, with an increase in funding of more than \$1 billion. University-based research provides the kind of fundamental insights that are most important in any new technology or treatment. It helps to produce the next generation of scientists, engineers, entrepreneurs. And we intend to give university-based research a major lift.

The budget supports increases not only in biomedical research, but also in all scientific and engineering fields. As you know, advances in one field are often dependent on breakthroughs in other disciplines. For example, advances in computer science are helping us to develop drugs more rapidly, and to move from sequencing the human genome to better understanding the functions of individual genes.

My budget supports a major new national nanotechnology initiative worth \$500 million. Cal Tech is no stranger to the idea of nanotechnology, the ability to manipulate matter at the atomic and molecular level. Over 40 years ago, Cal Tech's own Richard Symonds asked, what would happen if we could arrange the atoms one by one the way we want them? Well, you can see one example of this in this sign behind me, that Dr. Lane furnished for Cal Tech to hang as the backdrop for this speech. It's the Western hemisphere in gold atoms. But I think you will find more enduring uses for nanotechnology.

Just imagine, materials with 10 times the strength of steel and only a fraction of the weight; shrinking all the information at the Library of Congress into a device the size of a sugar cube; detecting cancerous tumors that are only a few cells in size. Some of these research goals will take 20 or more years to achieve. But that is why -- precisely why -- as Dr. Baltimore said, there is such a critical role for the federal government.

As I announced yesterday, this budget also includes an historic initiative to make higher education more affordable. I am well aware of the fact that I would not have become President of the United States without loans and grants and jobs that helped me get through college and law school; and that more and more, given the cost of higher education, a higher and higher percentage of our students need more of all those things. This has been a virtual obsession for me ever since I became President. I was determined to leave office saying we had opened the doors of college to all Americans.

We have come a long way, by changing the student loan program to make it less expensive and to give young people more options for paying off their loans, including as a percentage of their income when they leave school. We've increased the number of work-study grants from 700,000 to 1 million. We've dramatically increased the Pell Grant program, and the HOPE Scholarship tax credit and the Lifetime Learning tax credits we adopted in 1997 last year alone had almost 5 million beneficiaries in institutions of higher education in the United States.

Yesterday, I proposed that, for the first time, we make college tuition tax deductible, and that we do it in a way that would benefit even more people on more modest incomes so that they could get the same 28-percent benefit, even if they're in the 15-percent tax category. I think this is very important.

The budget contains another increase in Pell grants; special initiatives to help minority students get into science and engineering and graduate; and special efforts to try to do something about the extraordinarily high dropout rate from college.

Over two-thirds of the high school graduates are actually going to go into college this year. That's an increase of 10 percent in the last seven years. That's quite a large increase in a short time. But the dropout rate has increased correspondingly. We want to know why. Is it for financial reasons? Is it because people weren't prepared? Could they all be just idiosyncratic personal reasons? We intend to do everything we can with a very large test group to see what we can do to turn this situation around.

And, finally, we're going to double the size of our Gear-Up program to 1.4 million young people. That's the program where students in universities and college all across America mentor

middle-school kids who are at risk to try to help them develop the skills and the belief that they can go to college, and simultaneously to tell them and their parents exactly what they can expect in the way of aid under current law if they do go. Many people still don't know that the barriers to their going on to college have been removed. So I hope you will also support this part of our budget, because the young people of our country and their families need it.

In addition to announcing our new research budget and our efforts to make colleges more affordable, I'd like to try to achieve one other mission here today. First, I want to take a step back to acknowledge that we have not done a good enough job in helping all Americans to understand why we need very, very large investments in science and technology.

Far too many of our citizens think science is something done by men and women who are in white lab coats behind closed doors that somehow leads to satellite TV and Dolly the sheep. It's all a mystery. It is our responsibility to open the world of science to more of our fellow citizens; to help them understand the great questions science is seeking to answer and to help them see how those answers will actually affect their lives and their children's lives in profoundly important and positive ways.

First, we have to make sure Americans understand the contributions science and technology are making right now to the present level of economic growth, something Dr. Baltimore referred to. For example, because of our early investments in the Internet, America now leads the world in information technology, an industry that now accounts for a third of our economic growth, although only 8 percent of our work force; that generates jobs that pay 80 percent more than the private sector average.

Look what that means to ordinary people, and to the nature of the economy we're living in. I have never told the American people that we have repealed the laws of supply and demand, or the business cycle. But we have stretched them quite a lot.

In February, next month, we will have the longest economic expansion in the history of the United States -- outstripping even those that required full mobilization for war. Now, part of that is because we have pursued sound policies -- to get rid of the deficit; to start running surpluses, the first back-to-back surpluses in 42 years; to keep our markets open, with 270 trade

agreements; to argue not only exports are beneficial but we also benefit from the imports, because they're a powerful brake on inflation and allow us to continue to grow.

All we did in the government was to set the conditions, and provide the tools, for the American people to succeed. The real reason this thing keeps going on is the exponential growth in information technology, and how it is rifling through every other sector of our economy and reinforcing the materials science revolution which also continues to the present day.

When I became President, there were only 50 sites on the Worldwide Web -- 50. When I became President -- that seemed like a long time ago to the students, but the rest of you will know -- it's just like yesterday. There are now over 50 million. Think of it. In seven years, from 50 to over 50 million. It is changing everything about the way we work and live and relate to each other.

I was in Northern California a few weeks ago with a lot of really fascinating young people who work with E-bay -- a lot of you have probably bought things, maybe you've even sold things on E-bay. But for example, one of the things I learned is that in addition to the employees of E-bay, there are now 20,000 people whose primary source of income is buying and selling on E-bay. They do it for a living. A not insubstantial number of them were on welfare before they found a way to bring their entrepreneurial skills to bear by trading on E-bay. It has changed everything.

So we have to say to people, if you like the fact that we have the lowest unemployment and welfare rolls in 30 years, the lowest minority unemployment rates ever recorded, the lowest female unemployment rate in 40 years, the lowest poverty rates in 20 years, the lowest single household poverty rate in 46 years, you have to understand that all that, at least in large part, is because of the discoveries of science and technology that improve our ordinary lives. It is very, very important that all of us do a better job of that.

I have proposed in this budget a 36 percent increase in information technology research alone, so that researchers will be able to tackle a wide array of other challenges. How do we find, precisely, the piece of information we're looking for in an ever-larger ocean of raw data. How do we design computers that are usable by everyone including people with disabilities.

We were talking on the plane ride out here about one of the great things about being President is nearly anybody will come to talk to you -- once, anyway. We were talking about all the people I had been privileged to meet in the last seven years. I have developed quite a good personal friendship with Steven Hawking, who, as all of you know, has lived longer with Lou Gehrig's disease, as far as we know, than any person who's ever lived -- partly, I am convinced, because of not only the size of his brain, but the size of his heart. But it is fascinating to see what technology has permitted this man to do.

Just a few years ago, he could have had the biggest brain in the world, and no one could have known it, because it could not have gotten out. There is no speaking capacity, almost no movement left. He can just move his thumb, and hold in his hand this remarkable little tracer that goes through a whole dictionary of words that he has, that he runs through with rapid speed. He picks the word he wants, puts the sentences together, and then an automated voice tells you what he just said.

How can we make it even easier for him? How can we make it even easier for other people? This will be a huge issue. Make no mistake about it, the liberation of Americans with disabilities is also in no small measure the product of the revolution in science and technology.

There are also other uses. I read the other day that manufacturers are soon going to introduce a refrigerator that can scan the bar codes of empty packages and expired goods -- and order new groceries for you over the Internet. Now, everybody who's ever poured out a carton of bad milk will love this. You don't have to smell your bad milk anymore. It won't be long before the computer will refuse to order what's bad for you -- and only pick items off Dean Ornish's diet. And then we'll all be in great shape.

The second thing I think we have to do is let Americans know how investments in science and technology, broadly stated, will allow us to lead longer, healthier lives. Everybody knows now that we should put money into cancer research; and thank God we've discovered two of the genes that are high predictors of breast cancer, for example, in the last couple of years. But we need for more Americans to understand why we need a broad research agenda in science and technology, for the health of Americans.

In the 20th century, American life expectancy went from 47 years to almost 77 years, thanks to penicillin and vaccines

for many childhood diseases. We were talking the other day about the impact of the polio vaccine. I'm old enough to remember the first polio vaccine. I remember how our mothers herded us in line and made us stand there waiting for our shot. It was like they were all holding their breath, praying and hoping that we would get our shot before we got polio. It's something that young people today can hardly imagine, but it hung like a cloud over the families of my parents' generation. Now, we have this incredible life expectancy. The average American who lives to be 65 has a life expectancy of 83 -- already. And we are clearly on the cusp of greater advances.

Later this year, researchers expect to finish the first complete sequencing of the genome -- all 3 billion letters and 80,000 genes that make up our DNA code. Since so many diseases have a genetic component, the completion of this project will clearly lead to a revolution in our ability to detect, treat and prevent many diseases. For example, patients with some forms of leukemia and breast cancer soon may receive sophisticated new drugs that elegantly target the precise cancer cells with little or no risk to healthy cells. That will change everything.

Our new trove of genomic data may even allow us to identify and cure most genetic diseases before a child is even born. Most people just take it as a given now that within the next few years, when young mothers bring their babies home from the hospital, they will bring along genetic maps of their children's makeup, what the problems are, what the challenges are, what the strengths are. It will be scary to some extent, but it also plainly will allow us to raise our children in a way that will enhance the length and quality of their lives.

It's important to recognize that we never could have had the revolution in the genome project without the revolution in computer science as well. Research at the intersection between biomedical research and engineering will also lead to amazing breakthroughs. Already, scientists are working on an artificial retina to treat certain kinds of blindness, and methods of directly stimulating the spinal cord to allow people who are paralyzed to work. Now, you think of that.

Last year, for the first time, medical researchers transplanted nerves from the limbs to the spine of a laboratory animal that had its spine severed and achieved movement in the lower limbs for the first time. That had never happened before.

Now, because of advances in the intersection between science and engineering, we may not have to keep working on that. We may actually be able to program a chip that will stimulate the exact movements that were prevented by the severing or the injury of a spine. And all the people that we have seen hobbled by these terrible injuries might be able to get up and walk. Because there was medical research, yes, but there was also research on the engineering, nonbiological components of this endeavor. We have to do a better job of explaining that to the American people.

Third, advances in science and technology are helping us to preserve our environment in ways that preserve more sustainable and widespread economic growth. And that is very important.

Let me just give you an example. Not far from here in Southern California, a couple years ago the Department of Energy, working with the National Homebuilders and HUD, helped to construct a moderate- and low-income housing community, with glass in the windows that keeps out four or five times as much heat or cold. That, coupled with the latest insulation technology and the latest lighting in the house, enabled the houses to be marketed to people of modest incomes, with the promise that their electric bills would average 40 percent below what they would in a home of that size built in the traditional manner. I can tell you that after two years, the power bills are averaging 65 percent less. And we can't build enough houses for the people that want them.

The Detroit Auto Show this year is showcasing cars that, I'm proud to say, were developed as part of our partnership for New Generation Vehicles that the Vice President headed up, started back in '93. We brought in the auto workers and the auto companies and we said, look, instead of having a big fight about this, why don't we work together and figure out how to use technology to dramatically increase mileage. They're using fuel-injection engines, which cuts a lot of the greenhouse gas emissions; some are using mixed-fuel cars that start on electricity, switch to gasoline after you reach a certain need, and then go back to electricity when you slow down because 70 percent of the greenhouse gas emissions came in starting and stopping cars.

And there are all kinds of other things being developed. But this year the Detroit Auto Show has cars making 70, 80 miles a gallon, that are four-seater cars, that will be on the market in a couple of years. You can buy Japanese cars this year on the

market that get about 70 miles to the gallon, but they're small two-seaters. Last year I saw cars that are 500 to 1,000 pounds lighter than traditional cars, and score at least as well on all the damage tests -- again because of the revolution in material science, with composite materials being used in the cars.

The big thing that's coming up in this area before you know it, will crack the chemical barriers to truly efficient production of biomass fuels. One of the reasons you see this whole ethanol debate in the presidential campaign is that it takes seven gallons of gasoline to make eight gallons of ethanol. But they're on the verge of a chemical breakthrough that is analogous to the process that enable crude oil to be made efficiently into gasoline. When that happens, you'll be able to make eight gallons of biomass -- not just from corn, but from weeds, from rice hulls, from anything -- for about one gallon of fuel. That will be the equivalent therefore, in greenhouse gas terms, of cars that get hundreds of miles a gallon. The world then will be changed forever because one-third of our greenhouse gas emissions are in transportation.

Now, I just want to kind of go off the script a little to hammer this home, because big ideas in science matter. And once you make a big breakthrough, then thousands and thousands of things follow that have immense practical significance. But you must also know and believe that being in the grip of a big idea that is wrong can be absolutely disastrous.

So today, in Washington and in much of the world, there is a debate that goes something like this: The overwhelming evidence of science is that the climate is warming at an unsustainable rate due to human activity. And then there's this old idea, which says, well, that's really too bad, but a country can't grow rich or stay rich and sustain a middle-class lifestyle, unless every year it puts more greenhouse gases into the atmosphere than it did the year before. And you certainly can't drastically cut them, and maintain your level of wealth.

Our Administration spent hundreds of thousands of dollars last year complying with requests to appear before a House subcommittee that believes that our passion about climate change is some sort of subversive plot to wreck the American economy. Either that or -- you know, I've been reading too many kooky books or something. They think it's just crazy. Why? Because

they can't face the fact that we would do anything to hurt the American economy, and they really believe it would. So I would argue to you that here is a place where we're in the grip of an idea that is wrong.

Our efforts to get India and China, which will soon surpass us in greenhouse gas emissions, to cooperate with us, not in regulation, but in new technologies, to help them grow rich differently, always keep running up against the barrier of suspicious officials who believe somehow this is kind of an American plot to keep them poor. Why? Because they're in the grip of an idea that isn't right anymore. It is simply not true that to grow rich, you have to put more greenhouse gases in the atmosphere.

So again, I say we have to do a better job of explaining the contribution that science and technology can make to saving the planet and allowing us to still have prosperous lives -- and, I would argue, to allow us to have more prosperous lives and better lives that would otherwise be the case, certainly within 40 to 50 years, if we don't act and act now. This is profoundly important.

Finally, I think we have to do a better job of having an open debate about the responsibilities that all these advances and discoveries will clearly impose: The same genetic revolution that can offer new hope for millions of Americans could also be used to deny people health insurance; cloning human beings; information technology which helps to educate children and provide telemedicine to rural communities could also be used to create disturbingly detailed profiles of every move our citizens make on line.

The federal government, I think, has a role to play in meeting these challenges as well. That's why we've put forward strict rules and penalties to limit the use and release of medical records; why we've worked with Congress to ban the cloning of human beings, while preserving our ability to use the morally and medically acceptable applications of cloning technology; why we're working with the Internet industry to ensure that consumers -- consumers -- have control over how their personal information is used.

It's up to all of us to figure out how to use the new powers that science and technology give us in a responsible way. Just because we can do something doesn't mean we should. It is

incumbent, therefore, upon both scientists and public servants to involve the public in a great debate to ensure that science serves humanity -- always -- and never the other way around.

On this campus nearly 70 years ago, Albert Einstein said, "Never forget this, in the midst of your diagrams and equations: concern for man himself and his fate must always form the chief interest of all technical endeavors." Today, at the dawn of this new millennium, we see for all of you, particularly the young people in this audience, an era of unparalleled promise and possibility. Our relentless quest to understand what we do not yet know, which has defined Americans from our beginnings, will have more advances in the 21st century than at any other time in history. We must be wise as we advance.

I told you earlier that the First Lady sponsored a Millennium Evening with Vinte Cerf and Professor Lander. One of the most interesting things Professor Lander said about his genomic research confirmed not other scientific research, but the teachings of almost every religion. He said that, genetically, we are 99.9 percent the same. And he said, furthermore, that the genetic differences among individuals within a given racial or ethnic group are greater than the differences between groups as a whole -- suggesting that we are not only our brothers' and sisters' keepers, but in fundamental genetic ways, we are our brothers and sisters.

I leave you with this thought. I think the supreme irony of our time is that I can come here as President and have the high honor of discussing these unfathomable advances wrought by the human intellect, and the even greater ones yet to occur, in a world where the biggest social problem is the oldest demon of human society -- we are still afraid of people who aren't like us. And fear leads to distrust; distrust leads to dehumanization; dehumanization leads to violence.

It is really quite interesting that the end of the Cold War has marked an upsurge in ethnic and racial and tribal and religious hatred and conflict around the world; and that even in our own country we see countless examples of hate crimes from people who believe that others are different and, therefore, to be distrusted and feared and dehumanized.

You have the power to put science and technology to work advancing the human condition as never before. Always remember to keep your values at the core of what you do. And tell every

one of your fellow citizens, and indeed people with whom you come in contact all across the world, that every single scientific advance confirms over and over again the most important fact of life -- our common humanity.

Thank you very much.