English for Computer Science Students

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Учебное пособие может быть использовано для аналитического или домашнего чтения профессионально-ориентированных текстов, расширения словарного запаса, навыков профессионального общения на английском языке в устной или письменной форме. Состоит из 9 уроков, каждый из которых помимо текстов содержит ряд интересных упражнений, нацеленных на усвоение научно-технической лексики, а именно терминов, аббревиатур, акронимов и т.п. Пособие ориентировано как на занятия в аудитории, так и на самостоятельную работу.

Для студентов, аспирантов и всех, имеющих базовые знания английского языка и интересующихся акту-альными проблемами, связанными с возникновением, развитием и будущим компьютеров, с глобальной компьютеризацией общества.

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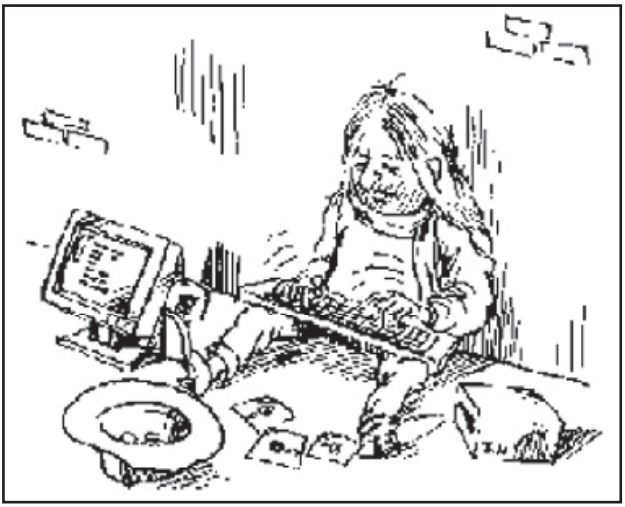
Unit I.
Hobby, Addiction, or Future Job?



Prereading Discussion

1. What is the computer? Computers are now widespread (commonplace), aren't they?
2. Did you learn about computers through science fiction, paperbacks, and movies like 2001: A Space Odyssey?
3. How old were you when you learnt about the computer?
4. What are the reasons for buying home computers?
5. Do you like playing on the computer?
6. What are your favorite video games (shoot'em-up, walk-through, role-playing games (RPG), or intellectual games?
7. How often do you work with the computer?
8. Does good knowledge of English help to operate the computer better?
9. Do you agree that English is a lifetime study and may serve a variety of purposes? What are they?
10. Who can be called a computer wizard? Do you attribute his/her success to hard work or talent?

11. Under what method do you study computers and English (in class, at home)? What are your study habits?
12. Why do you think you'll be good for a computer job?
13. Are you baffled by computer language? Wary of the World Wide Web? This quiz will help you "hack" terms you may encounter while surfing the Internet.

1. **cursor**, *n* — A: coarse speaker. B: indicator. C: moneychanger. D: technician.
2. **network**, *n* — A: TV channel. B: digital design. C: system of computers. D: filter.
3. **download**, *v* — A: to copy. B: scramble. C: erase. D: belittle.
4. **virus**, *n* — A: flaw. B: poison. C: fatigue. D: infection.
5. **browser**, *n* — software that allows you to A: explore the Internet. B: eavesdrop. C: send a fax. D: save a file.
6. **cracker**, *n* — A: fanatic. B: intruder. C: burglar. D: expert.
7. **hit**, *n* — A: accident. B: stumbling block. C: unit of measurement. D: visit.
8. **authenticate**, *v* — A: to fade. B: complicate. C: confirm. D: test.
9. **emoticon**, *n* — A: robot. B: radiation. C: trick. D: illustration.
10. **boot**, *v* — A: to fail gradually. B: enlarge. C: adjust. D: start up.
11. **server**, *n* — A: central computer. B: speed control. C: power supply. D: trouble-shooter.
12. **modem**, *n* — A: digital code. B: keyboard. C: visual display. D: connecting device.
13. **glitch**, *n* — A: flash. B: excitement. C: error. D: stroke of luck.
14. **compress**, *v* — A: to shrink. B: understand. C: fix. D: soften.
15. **pixel**, *n* — A: picture element. B: programming oddity. C: brief blur. D: long delay.
16. **link**, *n* — A: missing piece. B: space station. C: related site. D: warning signal.
17. **scanner**, *n* — machine that A: reproduces images. B: translates files. C: searches a document. D: adds color.
18. **log on**, *v* — A: to pile. B: gain access. C: waste time. D: stretch.
19. **shareware**, *n* — A: hand-me-down clothing. B: free hardware. C: relic. D: trial software.
20. **gigabyte**, *n* — A: sudden shutdown. B: unit of storage. C: wide gap. D: high pressure.

Reading Analysis

VOCABULARY LIST

***Nouns**: miracle, male/female, survey, statement, praise, item, gimmick, attitude (to), concern, score, addict, quest, access (to), overload.*
***Verbs**: to deliver, to conscript, to spread, to overtake, to mess, to appreciate, to earn, to interfere, to complicate, to proliferate, to curtail, to confess to.*
***Adjectives**: competitive, ambitious, vague, sensible, virtual, contemporary, brand-new, up-to-date, out-of-date, online.*
***Word combinations**: vintage car, catch phrase, to surf the Internet, to be suspicious, to leave behind, to get frustrated.*

TEXT I. COMPUTER STUDIES?

(1) If you're female, you're going to read this article and feel smug. If you are male, you might feel a desire to use the article to wrap up your old chewing gum or just get annoyed and play a computer game.

(2) According to a recent report, in Britain girls are overtaking boys at school. They are even beating them in subjects such as science and maths, which people used to think were subjects that boys were naturally better at. Surveys show there could be several reasons for this. Boys and girls behave very differently from each other both in and out of school.

(3) In school, statistics show boys mess about more and get into trouble more. Admittedly, they put up their hand to answer questions more but they often have the wrong answer. The girls who were interviewed said they often knew the correct answer but didn't like to put up their hand if they weren't absolutely sure. The survey also showed girls spent much longer doing homework and checking it with each other. Boys may argue that these things do not make girls more intelligent than boys and in some boys' opinions may even make many girls look like swots. However, these things do show that girls have a different attitude to school than boys. Girls are becoming much more competitive and ambitious.

(4) Experts believe that some boys are spending so much time playing computer games and watching violent films that they are living in a fantasy world. When girls talk about using home computers, they often discuss different types of software that they use for learning. Boys simply talk about computer games. When 14-year-old girls were asked what they would like to do in the future, they mentioned realistic jobs such as vet, teacher or doctor. The boys' ans-wers were either very vague such as, "I just want to be happy and have lots of money" or unrealistic and they said things such as, "I want to be a fighter pilot." Their answers were considered worrying because they did not seem very sensible and did not show any concern about unemployment. However, some people might believe that 14 is too young to worry anyhow. Also, the truth is that the majority of "top jobs" in England are still done by men so many might not see the need to worry. The good news is that after the age of 17, many boys become interested in school again and their exam results show that they have caught up. The problem is just keeping them interested until then...

(5) A lot of knowledge is a dangerous thing for addicts of the Internet. Information is becoming the drug of the new century.

(6) The research, conducted among 1000 managers in Britain, America, Europe and the Far East shows that, as information sources such as the Internet and cable news channels proliferate, we are witnessing the rise of a generation of dataholics.

(7) The quest for information can lead to stress. Almost two-thirds said their leisure time had been curtailed as a result of having to work late to cope with vast amounts of information; 70 percent reported loss of job satisfaction and tension with colleagues because of information overload.

(8) The study also investigated the habits of the children of 300 managers and found 55 per cent of parents were concerned their children would become information junkies.

(9) Forty-six per cent of parents believed their children spent more time on their PCs than interacting with friends. In one case a child had to be wheeled with his computer to the dinner table.

(10) Sue Feldman, mother of Alexander, 13, a self-confessed Internet-addict, said she had not yet been forced to wheeling her son and computer to the table, but said she often served him sandwiches and crisps at his bedroom computer.

(11) Alexander switches on his computer every day when he returns from Latymer School in Hammersmith to his home at Ealing, west

London. "I'd confess to spending up to four hours a day on the Internet looking for information and speaking to friends. It's like an addiction," Alexander said.

(12) "If I can't get on to my computer or the Internet, I do get really frustrated." He spends most of his time finding out the latest information on pop groups and facts for his homework.

(13) "My parents have to tell me to get off the computer, and they complain a lot, but they also see it as a good thing. Practically everyone in my class has a PC with Internet access so all my friends are also on-line. It's the way forward."

EXERCISES

I. The statements below were other results of the survey. Write G if you think the statement might refer to girls and B if you think it could refer to boys.

1. Learn to speak earlier.
2. Get nervous if there is a pause in the conversation between friends.
3. Take more risks.
4. Are spoken to more by parents.
5. Normally get more praise at school if they do something well.
6. Smoke more.

II. How modern are you? (pop quiz)

1. If you were able to have any car you wanted, what would you buy?
   a) I'd buy a restored vintage car that might become a collector's item.
   b) I'd buy a newly built car with all the latest technology.
   c) I wouldn't buy a car because I don't like them.
2. What is your attitude to new scientific developments?
   a) They're brilliant. They will help to make the world a much happier and better place.
   b) We know enough about science now. We should stop interfering with nature.
   c) Some things are good. Some things are bad.
3. How do you speak?
   a) I use a lot of new words, slang and catch phrases from the television and magazines.
   b) I use exactly the same words and phrases as my parents.
   c) I use a few new words because they are useful for what I want to say.

4. Which of the following do you think is the most enjoyable?
   a) Playing virtual reality computer games.
   b) Going to a disco/club that plays music from the 60s and 70s.
   c) Listening to techno music.
5. Which of the following would be your preferred way of finding out information?
   a) I like looking it up in a book.
   b) Surfing the Internet or using a CD-Rom is the best way.
   c) Watching a video is best.
6. You go to a friend's house. Their mother earns a lot of money and works and their father stays at home, cooks and cleans. What is your reaction?
   a) Nothing. It doesn't matter who works and who cleans. It's the 90s.
   b) A bit surprised. It seems a bit strange because it's unusual.
   c) The poor man. Cooking and cleaning is a woman's job.
7. Which of the following types of books or films do you prefer?
   a) Historical ones.
   b) Anything romantic.
   c) Contemporary ones about modern day things.
8. If your computer was six years old and worked perfectly well, which of the following would you do?
   a) I'd buy a brand new one so I could have new technology.
   b) I wouldn't do anything. I'd be happy with it. New technology is just gimmicks.
   c) I'd secretly hope it would break, despite the fact that I didn't need a new computer.

ADD UP YOUR SCORE AND READ THE ANALYSIS

	a	b	c
1	2	3	1
2	3	1	2
3	3	1	2
4	3	1	2
5	1	3	2
6	3	2	1
7	1	2	3
8	3	1	2

8—11: You are not modern at all and you don't want to be.You are suspicious of new things and don't make an effort to find out about them. You would prefer to live in the past. It's nice that you can appreciate the simple things in life but you must be careful not to get left behind. You are too traditional.

12—16: You are not very modern but you are not completely old-fashioned either.You like to live in aworld that has the good things from the past and some of the good things from the present too.

17—20: You are modern. You know a lot about what is happening around you and obviously enjoy progress. On the other hand, you are sensible and don't worry about buying and doing all the latest things just because they are fashionable.

21—24: Yes.You are very modern.Being up-to-date is very important to you.Sometimes perhaps it is too important.Remember that new things are not always the best things. Be careful not to become obsessed with every new thing that comes along.Some things are just clever marketing crazes that will complicate your life.

TEXT II. COMPUTER SYSTEMS

(1) Computers can be divided into three main types, depending on their size and power.

(2) Mainframe computers are the largest and most powerful. They can handle large amounts of information very quickly and can be used by many people at the same time.They usually fill awhole room and are sometimes referred to as mainframes or computer installations. They are found in large institutions like universities and government departments.

(3) Minicomputers, commonly known as minis, are smaller and less powerful than mainframes.They are about the size of an office desk and are usually found in banks and offices.They are becoming less popular as microcomputers improve.

(4) Microcomputers, commonly known as micros, are the smallest and least powerful.They are about the size of atypewriter.They can handle smaller amounts of information at atime and are slower than the other two types.They are ideal for use as home computers and are also used in education and business.More powerful microcomputers are gradually being produced; therefore they are becoming the most commonly used type of computers.

(5) A computer can do very little until it is given some information. This is known as the input and usually consists of a program and some data.

(6) A program is a set of instructions, written in a special computer language, telling the computer what operations and processes have to be carried out and in what order they should be done. Data, however, is the particular information that has to be processed by the computer, *e.g.* numbers, names, measurements. Data brought out of the computer is known as the output.

EXAMPLE: A computer calculating 3 + 4 = 7 uses the following program and data:

PROGRAM	Add two numbers then display the result.
INPUT DATA	3, 4
OUTPUT DATA	7

(7) When a program is run, i.e. put into operation, the computer executes the program step by step to process the data. The same program can be used with different sets of data.

(8) Information in the form of programs and data is called software, but the pieces of equipment making up the computer system are known as hardware.

(9) The most important item of hardware is the CPU (Central Processing Unit). This is the electronic unit at the center of the computer system. It contains the processor and the main memory.

(10) The processor is the brain of the computer. It does all the processing and controls all the other devices in the computer system.

(11) The main memory is the part of the computer where programs and data being used by the processor can be stored. However it only stores information while the computer is switched on and it has a limited capacity.

(12) All the other devices in the computer system, which can be connected to the CPU, are known as peripherals. These include input devices, output devices and storage devices.

(13) An input device is a peripheral, which enables information to be fed into the computer. The most commonly used input device is a keyboard, similar to a typewriter keyboard.

(14) An output device is a peripheral, which enables information to be brought out of the computer, usually to display the processed data. The most commonly used output device is a specially adapted television known as a monitor or VDU (Visual Display Unit). An-

other common output device is a printer. This prints the output of the CPU onto paper.

(15) A storage device is a peripheral used for the permanent storage of information. It has a much greater capacity than the main memory and commonly uses magnetic tape or magnetic disks as the storage medium.

(16) These are the main pieces of hardware of any computer system whether a small "micro" or a large mainframe system.

EXERCISES

I. Answer the following questions:

1. What type of computer is most suitable for home use?
2. What is a program?
3. What are the functions of main memory, input device, storage device?
4. What is data?
5. What are the functions of processor, output device, monitor?

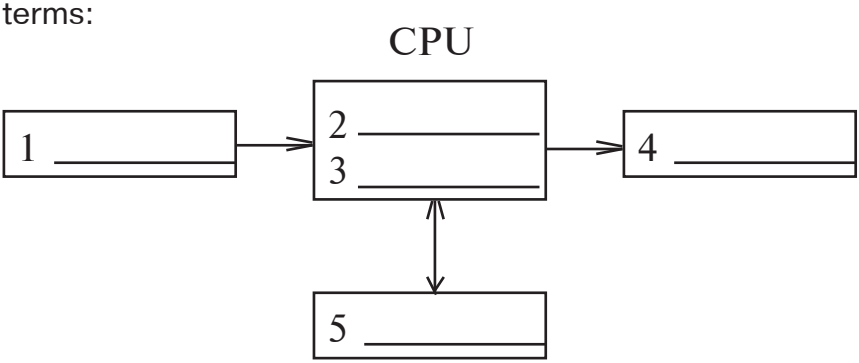
II. Match each component in column A with its function in column B:

A	B
1. Storage device	a. It displays the processed data
2. Input device	b. It holds the programs and data being used by the processor
3. Output device	c. It does all the processing and controls the peripherals
4. Main memory	d. It allows data to be entered
5. Processor	e. It provides permanent storage for programs and data

III. Complete the table:

	Mainframe	Minicomputer	Microcomputer
Size			
Power			
Use			

IV. Label the diagram of a computer system using these terms:



a) Main memory
b) Input device
c) Output device
d) Processor
e) Storage device

TEXT III. TO YOUR HEALTH

(1) Can all this computing be good for you? Are there any unhealthy side effects? The computer seems harmless enough. How bad can it be, sitting in a padded chair in a climate-controlled office?

(2) Health questions have been raised by the people who sit all day in front of the video display terminals (VDTs) of their computers. Are computer users getting bad radiation? What about eyestrain? And what about the age-old back problem, updated with new concerns about workers who hold their hands over a keyboard? What about repetitive-action injury also known as carpal tunnel syndrome? What about the risk of miscarriage?

(3) Unions and legislators in many communities continue to push for laws limiting exposure to video screens. Many manufacturers now offer screens with built-in protection.

(4) Meanwhile, there are a number of things workers can do to take care of themselves. A good place to begin is with an ergonomically designed workstation. Ergonomics is the study of human factors related to computers. A properly designed workstation takes a varie-ty of factors into account, such as the distance from the eyes to the

screen and the angle of the arms and wrists.

(5) Experts recommend these steps as coping mechanisms:

- Turn the screen away from the window to reduce glare, and cover your screen with a glare deflector. Turn off overhead lights; illuminate your work area with a lamp.
- Put your monitor on a tilt-and-swivel base.
- Get a pneumatically adjustable chair. Position the seat back so your lower back is supported.
- Place the keyboard low enough to avoid arm and wrist fatigue. Do not bend your wrists when you type. Use an inexpensive, raised wrist rest. Do not rest your wrists on a sharp edge.
- Sit with your feet firmly on the floor.
- Exercise at your desk occasionally rotating your wrist, rolling your shoulders, and stretching. Better yet, get up and walk around at regular intervals.

EXERCISES

I. Find in the text equivalents to:

вредные побочные эффекты; мягкое кресло; вентилируемое помещение; электромагнитное излучение; облучение; радикулит; усталость рук и кистей; рабочее место; верхнее освещение; учитывать (принимать в расчет); наклонная и вращающаяся подставка; уменьшить свечение; встроенная защита; пневматически регулируемое кресло; вращать; потягиваться; острый край,регулярно.

II. Fill in the table:

Problem	Disease	How to cope
VDT radiation	Eyestrain, headache, immune system diseases, risk of miscarriage	Increase distance from the eyes to the screen Install radiation protection devices (aglare reflector)
Staying indoors Autism		

III. Translate into English:

ОПАСНЫЕ ИГРЫ

Компьютеры становятся все более привычным атрибутом офисов и контор, школьных классов и даже детских садов.

Проведенные американскими учеными исследования показали, что переменные электромагнитные поля частотой 60 Гц могут вызывать глазные заболевания (в частности, катаракту), злокачественные опухоли, снижают иммунный статус организма.

Существует предположение о связи между частотой возникновения опухолей у детей и магнитными полями.

Специалисты из США, Канады, Испании и Швеции изучали воздействие переменных магнитных полей дисплейных мониторов на неблагоприятное течение беременности у женщин.

У женщин, которые во время беременности проводили не менее 20 часов в неделю за компьютерными терминалами, вероятность выкидышей на 80 % выше, чем у женщин, выполнявших ту же работу без помощи видеотерминалов.

Помните, что:

- при работе за видеотерминалом необходимо располагаться на расстоянии вытянутой руки от экрана;
- соседние дисплейные мониторы должны находиться от вас на расстоянии не менее 2 м 22 см.

Related Reading

MASTERS OF INVENTION

Nolan Bushnell born in 1943 is the father of home video games. He built Pong in 1972, starting the video-game craze that led to today's powerful super-systems.

During the 1950's and 1960's computers improved enormously. Still, only big businesses, universities and the military had them. Then in 1972 the videogame craze began.

Computers were scaled down to small boxes, using electronic circuitry instead of the Mark I's switches. They could do more than analyze data. They could play games.

The first big hit was a simple game called Pong. Two players sat in front of a television screen where a "ball", a point of light bounced back

and forth. Using knobs on a cabinet, the players could hit the ball with inch-long "paddles" on the screen.

Nolan Bushnell grew up near Salt Lake City, Utah. He loved to tinker with machines and became an electrical engineer. He played primitive computer games that were even older than Pong.

"I built it with my own two hands and a soldering iron", Bushnell said of his creation of the first Pong game.

In 1972 Bushnell founded Atari Inc. in Sunnyvale, Calif., to build Pong games. By 1975 there were 150,000 Pong games in American homes.

Steve Wozniak, born in 1950, and Steven Jobs, born in 1955, the young video game fanatics, working out of a garage, invented the Apple computer in 1976. The age of home computers was born.

One of Atari's early employees 19-year-old Steve Jobs and his friend, Steve Wozniak, who worked for another computer company, both loved video games.

Jobs and Wozniak dreamed of a personal computer, one that could do more than play games. From this dream, the Apple Computer Company started in a family garage.

In 1977 Jobs and Wozniak sold their first Apple II, which launched the personal computer industry. By 1985 they had sold more than two million Apple II's.

The Apple II was more than a toy. People could use it to write letters, keep financial records and teach their children. And, yes, they could play games on it. The Apple II evolved into today's high-tech Macintosh computers. These computers popularized the use of the mouse, the hand-controlled device that moves the cursor on a computer display.

ALL THE NEWS THAT FIT TO CLICK

You can't carry a computer as easily as you can a newspaper, but you'll find a lot of other things to like about online newspapers.

More than 100 daily papers in the United States and Canada publish electronic editions. You can connect with them using your computer, a modem and an Internet browser.

Online newspapers have the most up-to-date news. Both USA Today and The San Jose (California) Mercury News add stories to their electronic editions throughout the day.

"A good example was the OklahomaCity bombing (in April 1995)," said Steve Anderson of USA Today. "We had aphoto and astory online within minutes of it happening." Most newspaper readers had to wait until the next morning for their news.

Electronic newspapers also allow you to instantly learn more about anews story through hypertext links. For example, at the end of an online article about the New York Knicks might be headlines of other online articles on the basketball team. Just click on what you want to see next.

Ever wish you had saved a newspaper article, after you threw it away? With electronic newspapers, you can go online and find old articles you need for class discussions, reports or your own personal use.

"Everything that's appeared in The Mercury News for the last 10 years is available on our Web site or AmericaOnline," said Barry Parr of The San Jose Mercury News. "There are more than a million news stories in our database."

And you can search papers from all over the United States for the information you need — The Mercury News has links to 16 other papers. In the future, electronic newspapers may add all kinds of new features, like audio and video clips of news you can see and hear on your computer.

Will traditional newspapers ever disappear? Not likely — electronic newspapers are just one more way to reach more people.

WEB JAM

Res Rocket Surfer hasn't headlined amajor concert, and they don't have any gold records. But they've played all over the Internet globe as the world's first cyber-band.

Computer software called the Distributed Real-Time Groove Network (DRGN) lets groups of musicians jam on the Internet. It's like being in achat room, but instead of talking, you play instruments.

Each player sends his part of the impromptu jam session live through the Internet. A musician in Germany might start the beat by playing drums. Then someone else in England adds bass, and aperson in the United States plays the melody with alead guitar — all at once.

When you start playing, DRGN blends the music together, making it seem like everyone is playing at the same time in the same place — even if there are delays on the Internet.

DRGN was developed by Matt Moller and Canton Becker in March 1995. "DRGN provides the opportunity for people to meet and play music together who would have never met otherwise," Moller said. "People will be able to form global bands easily without the hassles of geographical boundaries."

FROM MR. DVORAK'S COLUMN IN THE FREE PERIODICAL MICROTIMES

Dear Mr. Dvorak:

Ann Landers wouldn't print this. I have nowhere else to turn. I have to get the word out. Warn other parents. Let me try and explain. It's about my son, Billy. He's always been agood, normal, ten-year-old boy. Well, last spring we sat down after dinner to select asummer camp for Billy. We sorted through the camp brochures. There were the usual camps with swimming, canoeing, games, and singing by the campfire — you know. There were sports camps and specialty camps for weight reduction, music, military camps, and camps that specialized in Tibetan knot tying. I tried to talk him into Camp Winnepoopoo. It's where he went last year. (He made an adorable picture out of painted macaroni). Billy would have none of it! Instead Billy pulled abrochure out of his pocket. It was for a COMPUTER CAMP! We should have put our foot down right there, if only we had known. He left three weeks ago. I don't know what's happened. He's changed. I can't explain it. See for yourself. These are some of my little Billy's letters.

Dear Mom,

The kids are dorky nerds. The food stinks. The computers are the only good part. We're learning how to program. Late at night is the best time to program, so they let us stay up.

Love, Billy.

Dear Mom,

Camp is O.K. Last night we had pizza in the middle of the night. We all get to choose what we want to drink. I drink Classic Coke. By the way, can you make Szechwan food? I'm getting used to it now. Gotta go, it's time for the flowchart class.

Love, Billy.

P.S. This is written on a word processor. Pretty swell, huh? It's spell-checked too.

Dear Mom,

Don't worry. We do regular camp stuff. We told ghost stories by the glow of the green computer screens. It was real neat. I don't have much of a tan "cause we don't go outside very often. You can't see the computer screen in the sunlight anyway. That wimp camp I went to last year fed us weird food too. Lay off, Mom. I'm okay, really.

Love, Billy.

Dear Mom,

I'm fine. I'm sleeping enough. I'm eating enough. This is the best camp ever. We scared the counselor with some phony worm code. It was real funny. He got mad and yelled. Frederick says it's okay. Can you send me more money? I've spent mine on a pocket protector and a box of blank diskettes. I've got to chip in on the phone bill. Did you know that you can talk to people on a computer? Give my regards to Dad.

Love, Billy.

Dear Mom,

Forget the money for the telephone. We've got a way to not pay. Sorry I haven't written. I've been learning a lot. I'm real good at getting onto any computer in the country. It's really easy! I got into the university's in less than fifteen minutes. Frederick did it in five; he's going to show me how. Frederick is my bunk partner. He's really smart. He says that I shouldn't call myself Billy anymore. So, I'm not.

Signed, William.

Dear Mom,

How nice of you to come up on Parents Day. Why'd you get so upset? I haven't gained that much weight. The glasses aren't real. Everybody wears them. I was trying to fit in. Believe me, the tape on them is cool. I thought that you'd be proud of my program. After all, I've made some money on it. A publisher is sending a check for $30,000. Anyway, I've paid for the next six weeks of camp. I won't be home until late August.

Regards, William.

Mother,

Stop treating me like a child. True— physically I am only ten years old. It was silly of you to try to kidnap me. Do not try again. Remember, I can make your life miserable (i.e. — the bank, credit bureau, and government computers). I am not kidding. O.K.? I won't write again and this is your only warning. The emotions of this interpersonal communication drain me.

Sincerely, William.

See what I mean? It's been two weeks since I've heard from my little boy. What can I do, Mr. Dvorak? I know that it's probably too late to save my little Billy. But, if by printing these letters you can save JUST ONE CHILD from a life of programming, please, I beg of you to do so. Thank you very much.

Sally Gates, Concerned Parent

Mr. Dvorak inadequately replied: Come on, Sally, boys will be boys.

ANSWERS TO THE TEST

1. **cursor** — [B] Movable indicator on computer screen; as, *He put the cursor after the last typed word.* Latin currere (to run).
2. **network** — [C] System of electronically joined computers; as, *A network offers many opportunities for sharing information.* Old English nett (knot) and weorc (act).
3. **download** — [A] To copy a file or program onto a personal computer; as, *She downloaded the transcript of the trial.* Old English adune (from the hill) and lad (carrying).
4. **virus** — [D] Digital infection or poison; as, *The virus wreaked havoc with the bank's accounting.* Latin.
5. **browser** — [A] Software that allows you to explore, or browser the Internet. French brouter (to graze or feed on).
6. **cracker** — [B] Intruder; someone who breaks into, or "cracks," computer systems; as, *In the film Mission: Impossible, Tom Cruise enters a high-security area with the aid of a cracker.* German krachen (to split).
7. **hit** — [D] Visit to a Web site. Old Norse hitta (to meet with).
8. **authenticate** — [C] To confirm the identity of a computer user; as, *Admittance was denied when the computer could not authenticate him.* Greek authentikos (genuine).
9. **emoticon** — [D] Illustration conveying a mood; as, *When viewed sideways, the emoticon :-) signifies happiness.* Also called smiley. Derived from emotion and icon.
10. **boot** — [D] To start up a computer. Abbreviation of bootstrap.
11. **server** — [A] Central computer sharing resources and data with other computers on a network. Latin servire (to be of use).
12. **modem** — [D] Connecting device between computers over a phone line; as, *The journalist submitted her article by modem.* Condensed form of modulator and demodulator.
13. **glitch** — [C] Error; malfunction; as, *A telecommunications glitch*

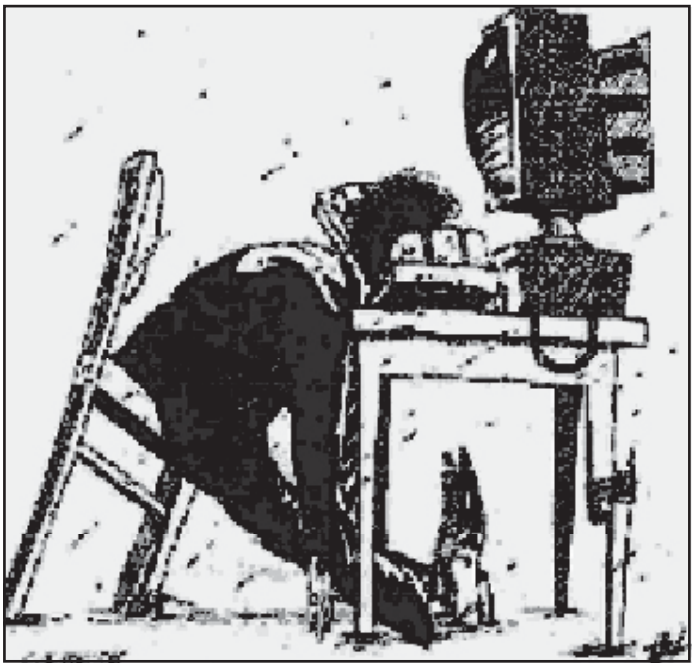
nearly wiped out the stockbroker's on-line trading. Origin unknown.

14. **compress** — [A] To shrink; store datain less space; as, *The manuscript was compressed on a single floppy disk.* Old French compresser.
15. **pixel** — [A] Picture element; basic unit of an on-screen image. Combination of pixand element.
16. **link** — [C] Related site on Internet; as, *One link sent him from Caruso to Pavarotti.* German Gelenk (joint).
17. **scanner** — [A] Machine that reproduces images onto a computer. Latin scandere (to climb).
18. **log on** — [B] To gain access to acomputer network; as, *A user ID and password will help you log on.* Origin unknown.
19. **shareware** — [D] Free trial software often requiring later payment. Combination of share and software.
20. **gigabyte** — [B] Unit of storage, roughly abillion bytes; as, *A gigabyte of work was saved on her home computer.* Combination of Greek gigas (giant) and avariant of bit (abbreviation for binary digit).

VOCABULARY RATINGS

10—14 correct: Good
15—17 correct: Excellent
18—20 correct: Exceptional

Unit II.
Computo, ergo sum



Prereading Discussion

1. What is your particular area of interest in computer science?
2. What are computers able to do?
3. How might computers affect your future career?
4. How important is it to be computer literate?
5. Are you a rule learner or a data gatherer?
6. Would you like to become a computer expert?
7. How do you think you ought to start?
8. How does it feel to be a computer student?
9. What disciplines does the course of instruction cover?

Reading Analysis

VOCABULARY LIST

***Nouns**: (il)literacy, flake, inventory, creativity, accountant, host(ess), surge, chaos, cyberphobia, glitch, havoc, executive.*
***Verbs**: to turn/hit/switch on/off, to search (for), to outstrip, to require, to bury, to accomplish, to click (with smth.) on smth., to flip on/off, to clash, to respond (to), to deal with, to intimidate, to foul (up), to rebel, to reveal, to hesitate, to avoid smth./doing smth.*
***Adjectives**: tiny, miraculous, (un)erring, microscopic, fragile, stray, preternatural, fearful, (ir)reparable, artificial.*
***Adverbs:** otherwise, accurately, seemingly, entirely, purposefully, scarcely, interestingly, frustratingly.*
***Word combinations**: tabula rasa, the DOS prompt, an errant instruction, under (out of) control, computer anxiety/phobia, to force into contact, as a result of, to launch nuclear missiles, to keep up with the pace of, computing environment, to be left behind (out), to cause smb. trouble, an invasion of one's privacy, junk mail, computer columnist, to come to terms with.*

TEXT I. WORRY ABOUT COMPUTERS? ME?

(1) When your computer is turned off, it is a dead collection of sheet metal, plastic, metallic tracings, and tiny flakes of silicon. When you hit On switch, one little burst of electricity — only about 5 volts — starts a string of events that magically brings to life what otherwise would remain an oversize paperweight.

(2) At first the PC is still rather stupid. Beyond taking inventory of itself, the newly awakened PC still can't do anything really useful, intelligent. At best it can search for intelligence in the form of operating system that gives structure to the PC's primitive existence. Then comes a true education in the form of application software — programs that tell it how to do tasks faster and more accurately than we could, a student who has outstripped its teacher.

(3) What makes your PC such a miraculous device is that each time you turn it on, it is a tabula rasa, capable of doing anything your creativity — or, more usually, the creativity of professional

programmers — can imagine for it to do. It is a calculating machine, a magical typewriter, an unerring accountant, and a host of other tools. To transform it from one persona to another requires setting some of the microscopic switches buried in the hearts of the microchips, a task accomplished by typing a command in DOS prompt or by clicking with your mouse on some tiny icon on the screen.

(4) Such intelligence is fragile and short-lived. All those millions of microscopic switches are constantly flipping on and off in time to dashing surges of electricity. All it takes is an errant instruction or a stray misreading of a single chip to send this wonderfully intelligent golem into a state of catatonia or hit the Off switch and what was a pulsing artificial life dies without a whimper. Then the next time you turn it on, birth begins all over again.

(5) PCs are powerful creations that often seem to have a life of their own. Usually they respond to a seemingly magic incantation typed as a C:>prompt or to wave of a mouse by performing tasks we couldn't imagine doing ourselves without some sort of preternatural help. There are the times when our PCs rebel and open the gates of chaos onto our neatly ordered columns of numbers, our carefully made sentences, and our beautifully crafted graphics. Are we playing with power not entirely under our control?

(6) A middle-aged woman sat down at a personal computer for the first time in her life. She placed her hands above the keyboard, ready to type — but hesitated. Turning to the instructor, she asked warily: "It won't know what I'm thinking, will it?" Such concerns abound among people whose knowledge of computers comes from movies like 2001: A Space Odyssey (in which Hal, the computer with the sticky-sweet voice, tries to take control of the spaceship). Terms such as computer anxiety and computer phobia have entered our language to describe such wariness. Many people try to avoid situations in which they might be forced into contact with computers. Even businesspeople who deal with computers daily may experience a form of cyberphobia — fear of computers. As a result of their fear, some office workers who are cyberphobic suffer nausea, sweaty palms, and high blood pressure. Young people who have grown up with computers may not understand these reactions.

(7) What are such people afraid of? Some may worry about the mathematical implications of the word computer. It seems to suggest

that only a person with strong analytical and quantitative skills can use the machine. In fact, as we see more and more often, even very young children whose math skills have yet to form can use computers.

(8) Some people are fearful of the computing environment. The movies love to portray old-fashioned, large computer systems — sanitized rooms walled by machines alive with blinking lights and spinning reels; it all looks intimidating. There is a notion that computers are temperamental gadgets and that, once a glitch gets into a computer system, it may wreak all kinds of havoc — from fouling up bank statements to launching nuclear missiles by mistake. Indeed, computer billing and banking errors are problems; however, most errors blamed on computers are the result of mistakes made by people. Computers do not put in the data they must work with, people do. Even so, correcting an error can be frustratingly slow.

(9) Many people worry about computers in relation to their jobs. Some people doubt they have the skills to find jobs and keep them in a technological labor market. Many feel that keeping up with the swift pace of technological change is impossible because it requires costly and continuous training and development. A good many present-day executives whose companies have installed computer terminals in their offices also worry about typing — either they do not know how to type or they are afraid they will lose status if they use a keyboard.

(10) Interestingly, there is another side to computer anxiety: the fear of being left out or left behind. If everyone around you is talking about, living with, and working around computers, how can you keep from revealing your limited understanding?

(11) People are also nervous that computers might fall into the wrong hands. As examples of electronic wrongdoing, try these for size: An "error" purposefully introduced into your computerized credit report by someone who wanted to cause you trouble might do irreparable damage to your financial standing, ending any hopes you might have for owning a home someday. An easily obtainable computerized list might carry personal information that could lead to an invasion of your privacy or at the least, a pile of junk mail. Think of all the forms you have filled out for schools, jobs, doctors, credit services, government offices, and so on. There is scarcely one fact related to you that is not on record in a computer file somewhere. Could unauthorized persons obtain this information?

(12) Computer fraud and computer security are not simple issues; they are concerns that society must take seriously.Should we, as computer columnist John Dvorak advocates, let things work themselves out in the courts? Or, should legislators be encouraged to create laws for society's protection?

EXERCISES

I. Find in the text the English equivalents to:

деловые люди; страх перед компьютерами; испытывать тошноту; высокое кровяное давление; математический смысл (значение); старомодные компьютерные системы; выглядеть устрашающе; мерцающие огни; вращающиеся катушки; временные приспособления; по ошибке; обвинять компьютеры; исправлять ошибки; установить терминалы; использовать клавиатуру; потерять статус; попасть в «дурные» руки; нанести непоправимый ущерб; невостребованная почта; заполнить бланк; записать в компьютерный файл; создать законы для защиты общества.

II. True or false?

1. People are not interested in computers, they just don't want to be left behind.
2. Computers are going to make many careers obsolete.
3. Most jobs will be lost because of computers.
4. Computers change the way jobs are performed.
5. People who refuse to have anything to do with computers may soon be regarded as people who refuse to learn to drive.
6. Computers are powerful, potentially dangerous tools with a life of their own.
7. Most of businesspeople write or commission their own programs.
8. Computers are now smaller and more powerful than ever before.
9. Computers have resulted in massive unemployment in many countries.
10. Managers with little or no computer experience should overrely on computers.
11. Computers can result in an invasion of people's privacy.
12. Today the challenge is to manage the information explosion through the use of well-designed information.

13. Data = information.
14. Computerization leads to elimination of workers' jobs (robots) and white-collar jobs (computers).
15. The bank computer thefts are carried out by computer whizzes who know the correct codes to use to access accounts in order to steal or manipulate money.
16. In afew seconds computer can make amistake so great that it would take many months to equal it.
17. Computer monitoring of people leads to job stress and more frequent illnesses.
18. One person's error is another person's data.
19. To err is human; to really foul things up requires acomputer.

III. Give definitions to:

a computer whiz (whizard), a hacker, a computer-literate person, a computer science student, a computer engineer, a computer programmer, a computer operator.

e.g. a system analyst is a person who identifies the information needed and develops a management info system with the assistance of computer programs.

IV. Give synonyms to:

swift, costly, financial standing, to introduce into, to obtain, issue, to concern, tiny, magic, artificial, to turn on, accurately, anxiety, fear, to lead to, old-fashioned command, to spin, to require.

V. Give antonyms to:

fraud, tiny, fragile, fearful, to frustrate, dead, intelligent, capable, short-lived, damage, to find jobs, slow, to foul up.

VI. Put the proper words into sentences

mistakes/errors, time, use/operation, improving, human, are, accuracy, so, part/role, make, involved, since, back, ever, replaced, more.

FEED IN ENGLISH, PRINT OUT IN FRENCH

Once upon a..., according to a much told story, a computer was set atask of translating "traffic jam" into French and back into English.

The machine buzzed, clicked, blinked its lights and eventually came up with "car-flavored marmalade". Machine translation has come a long way ... then. Computer translation systems are now in ... in many parts of the world.

Not surprisingly, the EEC is very ....With so many official languages, translating and interpreting take up ... than 50% of the Community's administrative budget. But although the efficiency of machine translation is ... rapidly, there's no question of ... translators being made redundant. On the contrary, people and machines work together in harmony. Today's computers ... of little value in translating literary works, where subtlety is vital, or the spoken word, which tends to be ungrammatical, or important texts, where absolute ... is essential. But for routine technical reports, working papers and the like, which take up ... much of the translation workload of the international organizations, computers are likely to play an increasing .... The method of operation will probably be for the machines to ... a rough version, which the translator will then edit, correcting obvious ..., and where necessary referring ... to the original.

If machines can translate languages, could they ... teach languages? Yes say enthusiasts, although they doubt that the teacher could ever be totally ... by a machine in the classroom. Good old teachers know best!

TEXT II. COMPUTER LITERACY FOR ALL

(1) Fortunately, fewer and fewer people are suffering from computer anxiety. The availability of inexpensive, powerful, and easier-to-use personal computers is reducing the intimidation factor. As new generations grow up in the Information Age, they are perfectly at home with computers.

(2) Why are you studying about computers? In addition to curiosity (and perhaps a course requirement!), you probably recognize that it will not be easy to get through the rest of your life without knowing about computers. Let us begin with a definition of **computer literacy** that encompasses three aspects of the computer's universal appeal:

- **Awareness**. Studying about computers will make you more aware of their importance, their versatility, their pervasiveness, and their potential for fostering good and (unfortunately) evil.
- **Knowledge**. Learning what computers are and how they work requires coming to terms with some technical jargon. In the

end, you will benefit from such knowledge, but at first it may be frustrating.

- **Interaction**. There is no better way to understand computers than through interacting with one. So being computer literate also means being able to use a computer for some simple applications.

(3) Note that no part of this definition suggests that you must be able to create the instructions that tell a computer what to do. That would be tantamount to saying that anyone who plans to drive a car must first become an auto mechanic. Someone else can write the instructions for the computer; you simply use the instructions to get your work done. For example, a bank teller might use a computer to make sure that customers really have as much money in their account as they wish to withdraw. Or an accountant might use one to prepare a report, a farmer to check on market prices, a store manager to analyze sales trends, and a teenager to play a video game. We cannot guarantee that these people are computer literate, but they have at least grasped the "hands-on" component of the definition — they can interact with a computer. Is it possible for everyone to be computer literate? Computer literacy is not a question of human abilities. Just about anyone can become computer literate. In the near future, people who do not understand computers will have the same status as people today who cannot read

(4) If this is your first computer class, you might wonder whether using a computer is really as easy as the commercials say. Some students think so, but many do not. In fact, some novice computer users can be confused and frustrated at first. Indeed, a few are so frustrated in the early going they think they never will learn. To their surprise, however, after a couple of lessons they not only are using computers but enjoying the experience.

(5) Some students may be taken aback when the subject matter turns out to be more difficult than they expected — especially if their only computer experience involved the fun of video games. They are confused by the special terms used in computer classes, as if they had stumbled into some foreign-language course by mistake. A few students may be frustrated by the hands-on nature of the experience, in which they have a one-to-one relationship with the computer. Their previous learning experiences, in contrast, have been shared and sheltered — they have been shared with peers in a classroom and sheltered by the guiding hand of an experienced

person. Now they are one-on-one with a machine, at least part of the time. The experience is different, and maybe slightly scary. But keep in mind that others have survived and even triumphed. So can you.

(6) And don't be surprised to find that some of your fellow students already seem to know quite abit about computers. Computer literacy courses are required by many schools and colleges and include students with varying degrees of understanding. That mixoften allows students to learn from one another — and provides afew with the opportunity to teach others what they know.

EXERCISES

I. Find in the text equivalents to:

компьютерная грамотность; доступность (наличие); осведомленность; век информации; прожить оставшуюся жизнь; притягательность компьютеров; снять с банковского счета; технический жаргон; взаимодействие; рекламный ролик; к удивлению; пара занятий; растеряться; предыдущий учебный опыт; поделиться со сверстниками; быть наедине с; помнить; страшноватый; однокурсники; вырасти в компьютерной среде; учиться друг у друга; пользователь-новичок.

II. Answer the following questions:

1. What does being computer literate mean?
2. What are the three aspects of the computer's universal appeal?
3. What is the best way to understand computers?
4. What are the simplest applications of computers?
5. What is the hand-on component of computer literacy?
6. What are some novice computer users frustrated by?
7. What is the first computer literacy skill?
8. Is it possible for everyone to be computer literate? Do you need any special talents?

III. Put the proper words into sentences:

computer networks, info, computer literate, routine, boring, repetitive tasks, accuracy, to come to terms with, quantative.

1. Society is heading in the direction of ...majority.
2. Computer programs now can integrate text, ...dataand graphs.

3. The source of ... is the computer.
4. It is difficult for some people to come ... the speed of change in the modern world.
5. Many ... which people find ... and tiring can now be carried out by machines.
6. Computers give us speed, ..., scope, quality, flexibility, large capacity, elimination of the ... and ..., increased efficiency.
7. We need ... with expanding computer technology and adjust our vision to a whole new world.
8. As more and more people are linked by ..., how soon will it be before the paperless office becomes a reality?

IV. Construct other sentences in these patterns (models):

1. At best the computer can search for intelligence in the form of operating system.
2. Computers might affect your future career.
3. Young people may not understand these cyberphobic reactions.
4. Computers do not put in the data they must work with, people do.
5. Could unauthorized persons obtain personal info?
6. Should legislators be encouraged to create laws for society's protection?
7. We cannot guarantee that anyone who drives a car is an auto mechanic.

V. Complete the sentences (if, when-clauses):

1. When your PC is turned off...
2. You will bring it to life when...
3. If everyone around you uses computers...
4. If you are taken aback how to use a computer...
5. As multimedia becomes more prevalent on the Web...
6. If you look on the entire Internet today...
7. If the program fails the test...
8. Don't open until...
9. If you are selling weapons, cryptography, military info, pornography...
10. If the program passes the test...
11. If you don't view your Web site as a global presence...

12. If Java is the answer,...
13. They will lose status if...
14. Provided you have the necessary tools...

TEXT III. WHY I WON'T BUY A COMPUTER

(1) I do not see that computers are bringing us one step nearer to anything that does matter to me: peace, economic justice, ecological health, political honesty, stability, good work.

(2) What would a computer cost me? More money than I can afford and more than I wish to pay to people whom I do not admire. But the cost would not be just monetary. It is well understood that technological innovation always requires the discarding of "the old model", what would be superseded would be not only something, but somebody.

(3) To make myself as plain as I can, I should give my standards for technological innovations in my work. They are as follows:

- The new tool should be cheaper than the one it replaces.
- It should be at least as small in scale as the one it replaces.
- It should work clearly and demonstrably better than the one it replaces.
- It should use less energy.
- If possible it should use some form of solar energy.
- It should be repairable by a person of ordinary intelligence, provided he has the necessary tools.
- It should be purchasable and repairable as near to home as possible.
- It should come from a small, privately owned shop or store that will take it back for maintenance and repair.
- It should not disrupt or replace anything good that already exists, and this includes family and community relationships.

EXERCISES

I. Answer the following questions:

1. What does the author think a computer would "cost" him?
2. Given the author's standards for technological innovation, what other new tools do you think he might object to?

3. How has technology changed your everyday life?
4. What new "gadgets" do you particularly like?
5. Have you learned to use acomputer? Why or why not?
6. Do you fear the power of computers?
7. List ten modern inventions:

Invention	Replacement	Advantage	Disadvantage
electricity			
telephone	writing letters	less time	too slow
silicon chip			
cellular phone			

8. True or false?
   - Modern technology is out of control, and ruining the quality of life on Earth; we must limit technology and its influence on individual.
   - Modern inventions are labor-saving devices. Without them people remain slaves to boring, repetitive work.
9. How will science and technology affect our lives in future?

II. Complete the following and discuss it:

1. Scientific and technological breakthroughs have brought great benefits. You only have to look around your own home to see...
2. Many illnesses can now be treated or cured, for example,...
3. Other examples of changes are...
4. Have our lives always been improved, however? Have we become too passive? Are we too dependent on technology? How dangerous could it be?
5. Take, for example, television, computer games, the Internet...
6. New products have also made amajor difference to our working lives.
7. Nowadays,...
8. In the future there may be even more major breakthroughs in the fields of medicine, leisure, work...
9. We may no longer have to...
10. We will be able to...

Topics for Essays, Oral or Written Reports

1. To be or not to be computer literate?
2. Pluses and minuses of computers.
3. How will computers affect our lives in future?
4. Discoveries, inventions, new products, and their effects (good and evil).

Essay Selection for Reading as a Stimulus for Writing

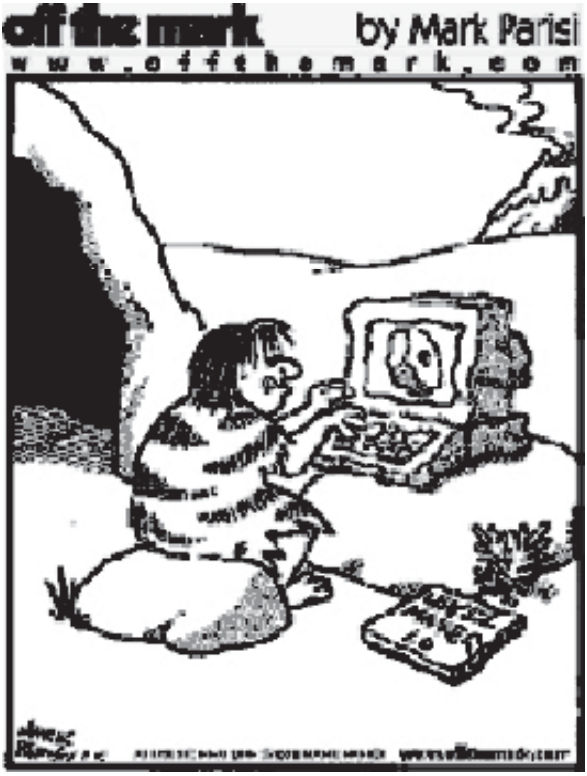
KEEP CLICKING!

Computers spoil your eyes, computers are bad for your nerves, computers — this, computers — that! Don't believe it! Why don't people criticize guns that kill much more people? "That's life", you'll say. Yes, but how can you blame such a wonderful thing like a computer, when you can't even use it properly? All evils imputed to computers are the results of our inexperience.

How can you blame computers for spoiling your eyes if you play Doom clones for hours? How can a computer be bad for your nerves if you cry out, "Damn, stupid piece of" (you know what) every time it hangs because of your being not too smart to tell it what you want to be done.

Come on, lighten up, computer is just a piece of hardware and software mixed. And if you don't know or can't decide how to make this explosive cocktail, ask yourself just one question: "Who is more stupid of you two?" Of course, I'm not a computer maniac beating everyone blaming an innocent machine. But there's one little thing people can't or don't want to understand: computers are not able to realize ideas you don't have and undertake the projects you haven't mentioned. They are just tools in your hands. And the results of using them are the results of your being patient to tell that old "Buddy Wiener" in a really simple binary way: "Come on, boy, do it!" Computers are of metal and plastic but if you don't scare them by your aggression, they do what should be done.

Unit III.
The Development of Computers



Prereading Discussion

1. What are tools?
2. What was the first tool?
3. What helped ape-like creatures evolve into human beings?
4. What is technology?
5. What tools of communication do you know?
6. What machines classify and modify information?
7. What do you know about Babbage, Pascal, Leibniz, and Jacquard?

Reading Analysis

VOCABULARY LIST

***Nouns**: ancestor, abacus, cloth, descendant, loom, pattern, precision, virtue.*
***Verbs**: to inherit, to preserve, to distort, to consist of, to trace back, to contribute to, to persist, to weave, to improve, to slide.*
***Adjectives**: outstanding, (un)reliable, (in)sufficient, decorative.*
***Word combinations**: along with, rather than, other than, manual dexterity, to come into widespread use.*

TEXT I. PREHISTORY

(1) Tools are any objects other than the parts of our own bodies that we use to help us do our work. Technology is nothing more than the use of tools. When you use a screwdriver, a hammer, or an axe, you are using technology just as much as when you use an automobile, a television set, or a computer.

(2) We tend to think of technology as a human invention. But the reverse is closer to the truth. Stone tools found along with fossils show that our ape-like ancestors were already putting technology to use. Anthropologists speculate that using tools may have helped these creatures evolve into human beings; in a tool-using society, manual dexterity and intelligence count for more than brute strength. The clever rather than the strong inherited the earth.

(3) Most of the tools we have invented have aided our bodies rather than our minds. These tools help us lift and move and cut and shape. Only quite recently, for the most part, have we developed tools to aid our minds as well.

(4) The tools of communication, from pencil and paper to television, are designed to serve our minds. These devices transmit information or preserve it, but they do not modify it in any way (If the information is modified, this is considered a defect rather than a virtue, as when a defective radio distorts the music we're trying to hear.)

(5) Our interest lies with machines that classify and modify information rather than merely transmitting it or preserving it. The machines that do this are the computers and the calculators, the so-called mind tools. The widespread use of machines for infor-

mation processing is a modern development. But simple examples of information-processing machines can be traced back to ancient times. The following are some of the more important forerunners of the computer.

(6) **The Abacus**. The abacus is the counting frame that was the most widely used device for doing arithmetic in ancient times and whose use persisted into modern times in the Orient. Early versions of the abacus consisted of a board with grooves in which pebbles could slide. The Latin word for pebble is calculus, from which we get the words abacus and calculate.

(7) **Mechanical Calculators**. In the seventeenth century, calculators more sophisticated than the abacus began to appear. Although a number of people contributed to their development, Blaise Pascal (French mathematician and philosopher) and Wilhelm von Leibniz (German mathematician, philosopher, and diplomat) usually are singled out as pioneers. The calculators Pascal and Leibniz built were unreliable, since the mechanical technology of the time was not capable of manufacturing the parts with sufficient precision. As manufacturing techniques improved, mechanical calculators eventually were perfected; they were used widely until they were replaced by electronic calculators in recent times.

(8) **The Jacquard Loom**. Until modern times, most information-processing machines were designed to do arithmetic. An outstanding exception, however, was Jacquard's automated loom, a machine designed not for hard figures but beautiful patterns. A Jacquard loom weaves cloth containing a decorative pattern; the woven pattern is controlled by punched cards. Changing the punched cards changes the pattern the loom weaves. Jacquard looms came into widespread use in the early nineteenth century, and their descendants are still used today. The Jacquard loom is the ancestor not only of modern automated machine tools but of the player piano as well.

EXERCISES

I. True or false?

1. The strong will inherit the earth.
2. In the beginning was the abacus.
3. The forerunner of the computer is the mechanical calculator.

4. The punched card is still very important for computers today.
5. The calculators Pascal and Leibniz built were reliable.
6. The mechanical calculator could multiply and divide as well as add and subtract.
7. Babbage invented the Jacquard loom.
8. "Beware of programmers who carry screwdrivers". (L. Brandwein)

II. Give synonyms to:

To aid, strength, to speculate, nothing more than, to lift, ancestors, to manufacture, to single out, precision, to perfect, in recent times, pattern, to develop, information-processing machine.

III. Give antonyms to:

Descendants, automated machine, exception, virtue, intelligence, to transmit, reliable, sufficient, in the early 19th century, in modern times.

TEXT II. THE ANALYTICAL ENGINE

(1) When was the automatic computer invented? In the 1930s or the 1940s? If you think that, you are only off by a hundred years. A computer that was completely modern in conception was designed in the 1830s. But, as with the calculators of Pascal and Leibniz, the mechanical technology of the time was not prepared to realize the conception.

(2) *Charles Babbage.* The inventor of that nineteenth-century computer was a figure far more common in fiction than in real life — an eccentric mathematician. Most mathematicians live personal lives not too much different from anyone else's. They just happen to do mathematics instead of driving trucks or running stores or filling teeth. But Charles Babbage was the exception.

(3) For instance, all his life, Babbage waged a vigorous campaign against London organ grinders. He blamed the noise they made for the loss of a quarter of his working power. Nor was Babbage satisfied with writing anti-organ-grinder letters to newspapers and members of Parliament. He personally hauled individual offenders before magistrates (and became furious when the magistrates declined to throw the offenders in jail).

(4) Or consider this. Babbage took issue with Tennyson's poem "Vision of Sin," which contains this couplet:

Every minute dies a man,
Every minute one is born.

Babbage pointed out (correctly) that if this were true, the population of the earth would remain constant. In a letter to the poet, Babbage suggested a revision:

Every moment dies a man,
And one and a sixteenth is born.

Babbage emphasized that one and a sixteenth was not exact, but he thought that it would be "good enough for poetry."

(5) Yet, despite his eccentricities, Babbage was a genius. He was a prolific inventor, whose inventions include the ophthalmoscope for examining the retina of the eye, the skeleton key, the locomotive "cow catcher," and the speedometer. He also pioneered operations research, the science of how to carry out business and industrial operations as efficiently as possible.

(6) Babbage was a fellow of the Royal Society and held the chair of Lucasian Professor of Mathematics at Cambridge University (the same chair once held by Isaac Newton, the most famous British scientist).

(7) **The Difference Engine**. The mathematical tables of the nineteenth century were full of mistakes. Even when the tables had been calculated correctly, printers' errors introduced many mistakes. And since people who published new tables often copied from existing ones, the same errors cropped up in table after table.

(8) According to one story, Babbage was lamenting about the errors in some tables to his friend Herschel, a noted astronomer. "I wish to God these calculations had been executed by steam." Babbage said. "It is quite possible," Herschel responded.

(9) (At that time, steam was a new and largely unexplored source of energy. Just as we might wonder today whether or not something could be done by electricity, in the early nineteenth century it was natural to wonder whether or not it could be done by steam.)

(10) Babbage set out to build a machine that not only would calculate the entries in the tables but would print them automatically as well. He called this machine the *Difference Engine*, since it worked by solving what mathematicians call "difference equations." Nevertheless, the name is misleading, since the machine constructed tables by means of repeated additions, not subtractions.

(11) (The word *engine*, by the way, comes from the same root as *ingenious*. Originally it referred to a clever invention. Only later did it come to mean a source of power.)
(12) In 1823, Babbage obtained a government grant to build the Difference Engine. He ran into difficulties, however, and eventually abandoned the project. In 1854, a Swedish printer built a working Difference Engine based on Babbage's ideas.
(13) **The Analytical Engine**. One of Babbage's reasons for abandoning the Difference Engine was that he had been struck by a much better idea. Inspired by Jacquard's punched-card-controlled loom, Babbage wanted to build a punched-card-controlled calculator. Babbage called his proposed automatic calculator the *Analytical Engine*.
(14) The Difference Engine could only compute tables (and only those tables that could be computed by successive additions). But the Analytical Engine could carry out any calculation, just as Jacquard's loom could weave any pattern. All one had to do was to punch the cards with the instructions for the desired calculation. If the Analytical Engine had been completed, it would have been a nineteenth-century computer.
(15) But, alas, the Analytical Engine was not completed. The government had already sunk thousands of pounds into the Difference Engine and received nothing in return. It had no intention of repeating its mistake. Nor did Babbage's eccentricities and abrasive personality help his cause any.
(16) The government may have been right. Even if it had financed the new invention, it might well have gotten nothing in return. For, as usual, the idea was far ahead of what the existing mechanical technology could build.
(17) This was particularly true since Babbage's design was grandiose. For instance, he planned for his machine to do calculations with fifty-digit accuracy. This is far greater than the accuracy found in most modern computers and far more than is needed for most calculations.
(18) Also, Babbage kept changing his plans in the middle of his projects so that all the work had to be started anew. Although Babbage had founded operations research, he had trouble planning the development of his own inventions.
(19) Babbage's contemporaries would have considered him more successful had he stuck to his original plan and constructed the Dif-

ference Engine. But then he would only have earned a footnote in history. It is for the Analytical Engine he never completed that we honor him as "father of the computer."

(20) **Lady Lovelace**. Even though the Analytical Engine was never completed, a demonstration program for it was written. The author of that program has the honor of being the world's first computer programmer. Her name was Augusta Ada Byron, later Countess of Lovelace, the only legitimate daughter of the poet, Lord Byron.

(21) Ada was a liberated woman at a time when this was hardly fashionable. Not only did she have the usual accomplishments in language and music, she was also an excellent mathematician. The latter was most unusual for a young lady in the nineteenth century. (She was also fond of horse racing, which was even more unusual.)

(22) Ada's mathematical abilities became apparent when she was only fifteen. She studied mathematics with one of the most well known mathematicians of her time, Augustus de Morgan. At about the time she was studying under de Morgan, she became interested in Babbage's Analytical Engine.

(23) In 1842, Lady Lovelace discovered a paper on the Analytical Engine that had been written in French by an Italian engineer. She resolved to translate the paper into English. At Babbage's suggestion, she added her own notes, which turned out to be twice as long as the paper itself. Much of what we know today about the Analytical Engine comes from Lady Lovelace's notes.

(24) To demonstrate how the Analytical Engine would work, Lady Lovelace included in her notes a program for calculating a certain series of numbers that is of interest to mathematicians. This was the world's first computer program. "We may say more aptly, Lady Lovelace wrote, "that the Analytical Engine *weaves algebraical patterns* just as the Jacquard-loom weaves flowers and leaves." Most aptly said indeed!

EXERCISES

I. Find in the text the English equivalents to:

гораздо привычнее; эксцентричный математик; водить грузовик; держать магазин; винить за; развязать кампанию против; нарушитель; отклонить(ся); оставаться постоянным; подчеркнуть

(усилить); достаточно хороший; несмотря на; плодовитый изобретатель; отмычка; член королевского общества; сокрушаться об ошибках; выполнять при помощи пара; гений; изобретательный; столкнуться с трудностями; забросить проект; далеко впереди; начать сначала; по предположению; в два раза длиннее; удачно сказано!

II. Answer the following questions:

1. What irritated and bored Charles Babbage?
2. Prove that Babbage was a prolific inventor.
3. What kind of machine was the Difference Engine?
4. What was the Babbage's reason for abandoning the project?
5. Contrast the Difference and the Analytical Engine.
6. Who has the honor of being the world's first computer programmer?
7. What do you know about Ada Lovelace (as a lady and as a programmer)?
8. Charles Babage is a computer Guru, isn't he?

III. Put the proper words into sentences

effort, obsolete, track, arithmetic, device, mathematicians, construct, Engine.

1. The famous philosophers Leibniz and Pascal both ... somewhat primi-tive calculating ...
2. After a great deal of time and ..., a working model of the Difference ... was...
3. Although the punched card is now becoming ..., it was of critical importance in the development of the computer.
4. An abacus is a ... that allows the operator to keep ... of numbers while doing the basic ... operations.
5. A square-shaped wheel wouldn't be ... because it wouldn't roll easily.
6. Charles Babbage disliked doing the great amount of ... that ... had to perform in course of solving problems.
7. "Automating" means ... machines to do jobs that people do.

IV. Construct other sentences in these patterns:

1. The inventor of the 19th century computer was a figure far more common in fiction than in real life.

2. They just happen to do mathematics instead of filling teeth.
3. Despite his eccentricities, Babbage was a genius.
4. If this were true, the population of the earth would remain constant.
5. I wish to God these calculations had been executed by steam.
6. We might wonder today whether or not something could be done by nuclear energy.
7. The government had no intention of repeating its mistakes. Nor did Babbage's abrasive personality help his cause any.
8. Even though the Analytical Engine was never completed, the program for it was written.
9. Her notes turned out to be twice as long as the paper itself.
10. It is for Analytical Engine he never completed that we honor Babbage as "father of the computer."

TEXT III. BABBAGE'S DREAM COMES TRUE

(1) **The Harvard Mark I**. A hundred years passed before a machine like the one Babbage conceived was actually built. This occurred in 1944, when Howard Aiken of Harvard University completed the Harvard Mark I Automatic Sequence Controlled Calculator.

(2) Aiken was not familiar with the Analytical Engine when he designed the Mark I. Later, after people had pointed out Babbage's work to him, he was amazed to learn how many of his ideas Babbage had anticipated.

(3) The Mark I is the closest thing to the Analytical Engine that has ever been built or ever will be. It was controlled by a punched paper tape, which played the same role as Babbage's punched cards. Like the Analytical Engine, it was basically mechanical. However, it was driven by electricity instead of steam. Electricity also served to transmit information from one part of the machine to another, replacing the complex mechanical linkages that Babbage had proposed. Using electricity (which had only been a laboratory curiosity in Babbage's time) made the difference between success and failure.

(4) But, along with several other electromechanical computers built at about the same time, the Mark I was scarcely finished before it was obsolete. The electromechanical machines simply were not

fast enough. Their speed was seriously limited by the time required for mechanical parts to move from one position to another. For instance, the Mark I took six seconds for a multiplication and twelve for a division; this was only five or six times faster than what a human with an old desk calculator could do.

(5) **ENIAC**. What was needed was a machine whose computing, control, and memory elements were completely electrical. Then the speed of operation would be limited not by the speed of mechani-cal moving parts but by the much greater speed of moving electrons.

(6) In the late 1930s, John V. Atanasoff of Iowa State College demonstrated the elements of an electronic computer. Though his work did not become widely known, it did influence the thinking of John W. Mauchly, one of the designers of ENIAC.

(7) ENIAC — Electronic Numerical Integrator and Computer — was the machine that rendered the electromechanical computers obsolete. ENIAC used vacuum tubes for computing and memory. For control, it used an electrical plug board, like a telephone switchboard. The connections on the plug board specified the sequence of operations ENIAC would carry out.

(8) ENIAC was 500 times as fast as the best electromechanical computer. A problem that took one minute to solve on ENIAC would require eight to ten *hours* on an electromechanical machine. After ENIAC, all computers would be electronic.

(9) ENIAC was the first of many computers with acronyms for names. The same tradition gave us EDVAC, UNIVAC, JOHNIAC, ILLIAC, and even MANIAC.

(10) **EDVAC**. The Electronic Discrete Variable Computer — EDVAC — was constructed at about the same time as ENIAC. But EDVAC, influenced by the ideas of the brilliant Hungarian-American mathematician John von Neumann, was by far the more advanced of the two machines. Two innovations that first appeared in EDVAC have been incorporated in almost every computer since.

(11) First, EDVAC used *binary notation* to represent numbers inside the machine. Binary notation is a system for writing numbers that uses only two digits (0 and 1), instead of the ten digits (0-9) used in the conventional decimal notation. Binary notation is now recognized as the simplest way of representing numbers in an electronic machine.

(12) Second, EDVAC's program was stored in the machine's memory, just like the data. Previous computers had stored the program externally on punched tapes or plug boards. Since the programs were stored the same way the data were, one program could manipulate another program as if it were data. We will see that such program-manipulating programs play a crucial role in modern computer systems.

(13) A stored-program computer — one whose program is stored in memory in the same form as its data — is usually called a *von Neumann machine* in honor of the originator of the stored-program concept.

(14) From the 1940s to the present, the technology used to build computers has gone through several revolutions. People sometimes speak of different *generations* of computers, with each generation using a different technology.

(15) **The First Generation**. First-generation computers prevailed in the 1940s and for much of the 1950s. They used vacuum tubes for calculation, control, and sometimes for memory as well. First-generation machines used several other ingenious devices for memory. In one, for instance, information was stored as sound waves circulating in a column of mercury. Since all these first-generation memories are now obsolete, no further mention will be made of them.

(16) Vacuum tubes are bulky, unreliable, energy consuming, and generate large amounts of heat. As long as computers were tied down to vacuum tube technology, they could only be bulky, cumbersome, and expensive.

(17) **The Second Generation**. In the late 1950s, the transistor became available to replace the vacuum tube. A transistor, which is only slightly larger than a kernel of corn, generates little heat and enjoys long life.

(18) At about the same time, the magnetic-core memory was introduced. This consisted of a latticework of wires on which were strung tiny, doughnut-shaped beads called *cores*. Electric currents flowing in the wires stored information by magnetizing the cores. Information could be stored in core memory or retrieved from it in about a millionth of a second.

(19) Core memory dominated the high-speed memory scene for much of the second and third generations. To programmers during this period, *core* and *high-speed memory* were synonymous.

(20) **The Third Generation**. The early 1960s saw the introduction of *integrated circuits*, which incorporated hundreds of transistors on a single silicon chip. The chip itself was small enough to fit on the end of your finger; after being mounted in a protective package, it still would fit in the palm of your hand. With integrated circuits, computers could be made even smaller, less expensive, and more reliable.

(21) Integrated circuits made possible *minicomputers*, tabletop computers small enough and inexpensive enough to find a place in the classroom and the scientific laboratory.

(22) In the late 1960s, integrated circuits began to be used for high-speed memory, providing some competition for magnetic-core memory. The trend toward integrated-circuit memory has continued until today, when it has largely replaced magnetic-core memory.

(23) The most recent jump in computer technology came with the introduction of *large-scale integrated circuits*, often referred to simply as *chips*. Whereas the older integrated circuits contained hundred of transistors, the new ones contain thousands or tens of thousands.

(24) It is the large-scale integrated circuits that make possible the *microprocessors* and *microcomputers*. They also make possible compact, inexpensive, high-speed, high-capacity integrated-circuit memory.

(25) All these recent developments have resulted in a *microprocessor revolution*, which began in the middle 1970s and for which there is no end in sight.

(26) **The Fourth Generation**. In addition to the common applications of digital watches, pocket calculators, and personal computers, you can find microprocessors — the general-purpose processor-on-a-chip — in virtually every machine in the home or business — microwave ovens, cars, copy machines, TV sets, and so on. Computers today are hundred times smaller than those of the first gene-ration, and a single chip is far more powerful than ENIAC.

(27) **The Fifth Generation**. The term was coined by the Japanese to describe the powerful, *intelligent* computers they wanted to build by the mid-1990s. Since then it has become an umbrella term, encompassing many research fields in the computer industry. Key areas of ongoing research are artificial intelligence (AI), expert systems, and natural language.

EXERCISES

I. Find in the text the English equivalents to:

задумать; быть знакомым с; предвкушать; лабораторный курьез; механические соединения; телефонный коммутатор; последовательность операций; потребовалась минута для решения; под влиянием идей; акроним для названия; тогда как; играть решающую роль; в честь кого-то; ртутный столбик; энергоемкий; вырабатывать большое количество тепла; громоздкий; стать доступным; извлекать из памяти; поместиться на ладони (на кончике пальца); скачок в технике; включать; продолжающиеся исследования; придумать термин; всеохватывающий термин (номинация).

II. Give synonyms to:

to encompass, bulky, simply, scarcely, ongoing, linkage, to conceive, to anticipate, to be familiar with, fast, advanced, obsolete.

III. Give antonyms to:

success, externally, to store, energy-consuming, cumbersome, expensive, binary notation, end in sight, obsolete.

IV. Put the proper words into sentences:

analytical, digital, unreliable, sophisticated, solve, core, processor, computations, an integral circuit.

1. The Difference Engine could ... equations and led to another calculating machine, the ... Engine, which embodied the key parts of a computer system: an input device, a ..., a control unit, a storage place, and an output device.
2. Ada Lovelace helped to develop instructions for carrying out ... on Babbage machine.
3. J. Atanasoff devised the first ... computer to work by electronic means.
4. First-generation computers were ..., the main form of memory being magnetic...
5. In the third generation software became more...
6. What was the name of the first ... computer to work electronically?
7. When electricity passed through the ..., it could be magnetized as either “off” or “on”.
8. A ... is a complete electronic circuit on a small chip of silicon.

V. Answer the following questions:

1. What was the main shortcoming of the Mark I and the other electromechanical computers?
2. What is an acronym? Give examples of acronyms.
3. What was the distinguishing feature of ENIAC?
4. What were the two distinguishing features of EDVAC?
5. What is a von Neumann machine?
6. Describe the technological features characteristic of each computer generation.
7. What type of computer memory was once so widely used that its name became almost synonymous with "high-speed memory"?
8. What technological developments made (a) minicomputers and (b) microcomputers possible?

VI. Construct other sentences in these patterns:

1. It was a machine like the one Babbage conceived.
2. That has ever been or ever will be.
3. Using electricity made the difference between success and failure.
4. This work did influence the thinking of the designers of ENIAC.
5. It took one minute to solve a problem on ENIAC.
6. EDVAC was by far the more advanced of the two machines.
7. One program could manipulate another program as if it were data.
8. People sometimes speak of different generations of computers, with each generation using a different technology.
9. Integrated circuits made possible minicomputers, small enough to find place in the classroom.
10. It is the large-scale integrated circuits that make possible microprocessors.

VII. Make a timeline map: ()

Times	Inventions/ Developments	Inventors
recent times	Analytical Engine	Von Neumann
17th century	Abacus	Pascal (Leibniz)
World War II	ENIAC/vacuum tubes	Herman Hollerith

Times	Inventions/ Developments	Inventors
thousands of years ago	Primitive calculating devices	George Boole
19th century	Transistors, printed circuits, microchips	Charles Babbage
early 20th century	Stored programs	Ada Lovelace
after World War II	Mechanical calculator	Jobs/Wozniak
in 1944	Punched card	Aiken
	First computer program First PC First digital computer, Mark I	Atanasoff/Berry

VIII. Translate into English

1. Орудия — это любые предметы помимо частей нашего собственного тела, которые мы используем, чтобы помочь себе выполнить работу.
2. Антропологи считают, что использование орудий могло бы помочь эволюции человекоподобных существ и превращению их в людей; в обществе, использующем орудия, ловкость рук и ум значат гораздо больше, чем грубая сила. Умные, а не сильные, унаследовали Землю.
3. Нас интересуют машины, которые классифицируют и модифицируют информацию, а не просто передают ее или хранят.
4. Калькуляторы, сделанные Паскалем и Лейбницем, были ненадежны, так как технология того времени была не в состоянии производить детали с достаточной точностью.
5. Компьютер, полностью современный по концепции, был задуман в 30х годах 19 века.
6. Бэббидж был плодотворным изобретателем, его разработки включают такие, как офтальмоскоп, отмычки, спидометр,

«скотосбрасыватель» и др. Несмотря на свою эксцентричность, он был гением.

7. Одной из причин, по которой Бэббидж забросил свою разностную машину, была гораздо лучшая идея, пришедшая ему в голову. Вдохновленный жаккардовым станком, управляемым перфокартами, Бэббидж захотел сделать калькулятор, управляемый перфокартами.
8. Именно из-за аналитической машины, которую он никогда не завершил, Бэббидж имеет честь называться «отцом компьютера».
9. Автор демонстрационной программы для аналитической машины Ада Ловлис стала первым в мире компьютерным программистом.По предложению Бэббиджа, переводя статью об аналитической машине, написанную итальянским инженером по-французски, она добавила собственные замечания, которые оказались в два раза длиннее самой статьи.
10. Аналитическая машина «ткет» алгебраические узоры точно так же, как станок Жаккарда ткет цветы и листья.Действительно удачно сказано!
11. Модель I — самая близкая к аналитической машина, которая когда-либо была или будет создана.
12. Наряду с несколькими другими электромеханическими компьютерами, построенными приблизительно в то же время, Модель I устарела сразу же после того, как была завершена.
13. Люди иногда говорят о различных поколениях компьютеров, причем каждое поколение использует разную технологию. Машины первого поколения использовали несколько хитроумных устройств для запоминания. В одном, например, информация хранилась в качестве звуковых волн, циркулирующих в столбике ртути.
14. Вакуумные лампы были громоздкими, ненадежными, энергоемкими и вырабатывали огромное количество тепла.
15. Транзистор размером чуть больше ядрышка хлебного зерна вырабатывает мало тепла и живет долго.
16. Вначале 60х наблюдалось внедрение интегральных схем, которые включали сотни транзисторов на одном силиконовом чипе. Именно большие интегральные схемы сделали возможными микропроцессоры и микрокомпьютеры.
17. Сегодняшние компьютеры раз в 100 меньше, чем компьютеры 1го поколения, а каждый отдельный чип гораздо мощнее ENIAC.

Topics for Essays, Oral or Written Reports

1. From the abacus to the computer.
2. The evolution of computers in terms of generations.
3. Computer — a God's gift or a Devil's toy?
4. If I were the inventor of computer ...
5. If there were no computers they had to be thought out.
6. Science fiction: serving the science.

Unit IV.
Personal Computers

Prereading Discussion

1. Who uses computers today? Give examples of the impact they have on our lives.
2. When did the first personal computer appear? How was it different from the computers that preceded it?
3. How have computers changed since the first one was introduced in the early 1940s?
4. Where is the Silicon Valley? How is it related to the computer industry?

Reading Analysis

VOCABULARY LIST

***Verbs**: anticipate, collaborate, devise, donate, emerge, foresee, intimidate, market, thrive.*
***Nouns**: application, capacity, components, entrepreneur, expertise, gadget, innovation, investment, potential, technology, venture, wizard, pioneer, integrated circuit, microprocessor, circuit, peripherals.*
***Adjectives/Participles**: cumbersome, genuine, inevitable, makeshift, massive, muted, skeptical, state-of-the-art, user-friendly.*
***Adverbials:** passionately, technologically, thereby, whereas.*

TEXT I. THE EARLY YEARS

(1) Until the late 1970s, the computer was viewed as a massive machine that was useful to big business and big government but not to the general public. Computers were too cumbersome and expensive for private use, and most people were intimidated by them. As technology advanced, this was changed by a distinctive group of engineers and entrepreneurs who rushed to improve the designs of then current technology and to find ways to make the computer attractive to more people. Although these innovators of computer technology were very different from each other, they had a common enthusiasm for technical innovation and the capacity to foresee the potential of computers. This was a very competitive and stressful time, and the only people who succeeded were the ones who were able to combine extraordinary engineering expertise with progressive business skills and an ability to foresee the needs of the future.

(2) Much of this activity was centered in the Silicon Valley in northern California where the first computer-related company had located in 1955. That company attracted thousands of related businesses, and the area became known as the technological capital of the world. Between 1981 and 1986, more than 1000 new technology-oriented businesses started there. At the busiest times, five or more new companies started in a single week.

The Silicon Valley attracted many risk-takers and gave them an opportunity to thrive in an atmosphere where creativity was expected and rewarded.

(3) Robert Noyce was a risk-taker who was successful both as an engineer and as an entrepreneur. The son of an Iowa minister, he was informal, genuine, and methodical. Even when he was running one of the most successful businesses in the Silicon Valley, he dressed informally and his office was an open cubicle that looked like everyone else's. A graduate of the Massachusetts Institute of Technology (MIT), he started working for one of the first computer-related businesses in 1955. While working with these pioneers of computer engineering, he learned many things about computers and business management.

(4) As an engineer, he co-invented the integrated circuit, which was the basis for later computer design. This integrated circuit was less than an eighth of an inch square but had the same power as a transistor unit that was over 15 inches square or a vacuum tube unit that was 6.5 feet square. As a businessman, Noyce co-founded Intel, one of the most successful companies in the Silicon Valley and the first company to introduce the microprocessor. The microprocessor chip became the heart of the computer, making it possible for a large computer system that once filled an entire room to be contained on a small chip that could be held in one's hand. The directors of Intel could not have anticipated the effects that the microprocessor would have on the world. It made possible the invention of the personal computer and eventually led to the birth of thousands of new businesses. Noyce's contributions to the develop-ment of the integrated circuit and the microprocessor earned him both wealth and fame before his death in 1990. In fact, many people consider his role to be one of the most significant in the Silicon Valley story.

(5) The two men who first introduced the personal computer (PC) to the marketplace had backgrounds unlike Robert Noyce's. They had neither prestigious university education nor experience in big business. Twenty-year-old Steven Jobs and twenty-four-year-old Stephen Wozniak were college drop-outs who had collaborated on their first project as computer hobbiests in a local computer club. Built in the garage of Jobs's parents, this first personal computer utilized the technology of Noyce's integrated circuit.

It was typewriter-sized, as powerful as a much larger computer, and inexpensive to build. To Wozniak the new machine was a gadget to share with other members of their computer club. To Jobs, however, it was a product with great marketing potential for homes and small businesses. To raise the $1300 needed to fill their first orders Jobs sold his Volkswagen bus and Wozniak sold his scientific calculator. Wozniak built and delivered the first order of 100 computers in ten days. Lacking funds, he was forced to use the least expensive materials, the fewest chips, and the most creative arrangement of components. Jobs and Wozniak soon had more orders than they could fill with their makeshift production line.

(6) Jobs and Wozniak brought different abilities to their venture: Wozniak was the technological wizard, and Jobs was the entrepreneur. Wozniak designed the first model, and Jobs devised its applications and attracted interest from investors and buyers. Wozniak once admitted that without Jobs he would never have considered selling the computer or known how to do it. "Steve didn't do one circuit, design or piece of code. He's not really been into computers, and to this day he has never gone through a computer manual. But it never crossed my mind to sell computers. It was Steve who said, 'Let's hold them up and sell a few.'"

(7) From the very beginning, Apple Computer had been sensitive to the needs of a general public that is intimidated by high technology. Jobs insisted that the computers be light, trim, and made in muted colors. He also insisted that the language used with the computers be "user-friendly" and that the operation be simple enough for the average person to learn in a few minutes. These features helped convince a skeptical public that the computer was practical for the home and small business. Jobs also introduced the idea of donating Apple Computers to thousands of California schools, thereby indirectly introducing his product into the homes of millions of students. Their second model, the Apple II, was the state-of-the-art PC in home and small business computers from 1977 to 1982. By 1983 the total company sales were almost $600 million, and it controlled 23 percent of the worldwide market in personal computers.

(8) As the computer industry began to reach into homes and small businesses around the world, the need for many new products for the

personal computer began to emerge. Martin Alpert, the founder of Tecmar, Inc., was one of the first people to foresee this need. When IBM released its first personal computer in 1981, Alpert bought the first two models. He took them apart and worked twenty-four hours a day to find out how other products could be attached to them. After two weeks, he emerged with the first computer peripherals for the IBM PC, and he later became one of the most successful creators of personal computer peripherals. For example, he designed memory extenders that enabled the computer to store more information, and insertable boards that allowed people to use different keyboards while sharing the same printer. After 1981, Tecmar produced an average of one new product per week.

(9) Alpert had neither the technical training of Noyce nor the computer clubs of Jobs and Wozniak to encourage his interest in computer engineering. His parents were German refugees who worked in a factory and a bakery to pay for his college education. They insisted that he study medicine even though his interest was in electronics. Throughout medical school he studied electronics passionately but privately. He became a doctor, but practiced only part time while pursuing his preferred interest in electronics. His first electronics products were medical instruments that he built in his living room. His wife recognized the potential of his projects before he did, and enrolled in a graduate program in business management so she could run his electronics business successfully. Their annual sales reached $1 million, and they had 15 engineers working in their living room before they moved to a larger building in 1981. It wasn't until 1983 that Alpert stopped practicing medicine and gave his full attention to Tecmar. By 1984 Tecmar was valued at $150 million.

(10) Computer technology has opened a variety of opportunities for people who are creative risk-takers. Those who have been successful have been alert technologically, creatively, and financially. They have known when to use the help of other people and when to work alone. Whereas some have been immediately successful, others have gone unrewarded for their creative and financial investments; some failure is inevitable in an environment as competitive as the Silicon Valley. Rarely in history have so many people been so motivated to create. Many of them have been rewarded greatly with fame and fortune, and the world has benefited from this frenzy of innovation.

EXERCISES

I. Find in the text the English equivalents to:

рассматривать как; слишком дорогая; для личного пользования; существующая тогда технология; сделать привлекательным; предвидеть потенциал; технические знания; одеваться неформально; менее одной восьмой дюйма; значительная роль; выполнять заказы; испытывать недостаток в фондах; быть вынужденным; самодельный (временный) конвейер; приходить в голову; чувствительный к нуждам; убедить скептиков; тем самым; дать возможность; съемные платы; поддержать интерес к; немецкие беженцы; ежегодная продажа; тогда как; конкурентная среда; неизбежные неудачи; вознагражденные славой и богатством.

II. True or false?

1. Robert Noyce graduated from a prestigious university and gained engineering expertise before he devised the integrated circuit.
2. Robert Noyce was one of the pioneers of the computer industry.
3. The microprocessor influenced the world in ways that its inventors did not foresee and subsequently led to the invention of the integrated circuit.
4. Stephen Wozniak and Steven Jobs used the state-of-the-art technology developed by Robert Noyce when they devised the first personal computer.
5. When Wozniak designed the first model of the PC, he did not plan to market it to the general population.
6. Jobs did not want the PC to be as intimidating to the general public as previous computers were, so he insisted that it include features that were practical and attractive.
7. The Apple Computer company sold their computers to thousands of American schools at discounted rates, thereby introducing their product into the homes of millions of students.
8. Martin Alpert foresaw that the success of the first IBM personal computer was inevitable, so he bought the first two models and devised ways to change them.
9. Martin Alpert's wife was skeptical about the potential of her husband's technical innovations.
10. Alpert's interest in technology was more passionate than his interest in medicine.

III. Give a synonym for words in parentheses:

1. Steven Jobs and Stephen Wozniak (worked together) to (invent) the personal computer, and then produced it in a (temporary) production line in a garage.
2. Steven Jobs wanted to (advertise and sell) the personal computer to people who would use it in their homes, so he knew it could be neither (very large) nor (awkward).
3. Stephen Wozniak applied the (most up-to-date) (applied science) when designing the first personal computer, while Steven Jobs designed its (practical functions).
4. People seemed to be less (frightened) by computers when they were made in (soft) colors and were (easily understood by the average person).
5. Robert Noyce's (specialization) in computers was a result of his experience with the (first people) in the computer field while working at his first job.
6. Martin Alpert's wife was never (doubtful) about (the future possibilities) of Tecmar.
7. Martin Alpert studied the first IBM personal computer (with great love and emotion), and (by that means) he was the first innovator to (come forward) with (supplementary devices) for the computer.
8. Whereas some people (grow) as a result of competition, others are (threatened) by it.

IV. Some of the following statements describe an act of an entrepreneur (E), others describe an act of an inventor (I), and others could describe both titles (B). Identify each one and be prepared to explain your answer.

1. Alexander Graham Bell originated the first telephone.
2. Robert Noyce co-invented the integrated circuit and co-founded Intel.
3. In 1890 John Loud created the first ballpoint pen.
4. Robert Noyce's engineering expertise contributed to the development of the microprocessor.
5. Robert Noyce's financial investments helped build one of the most successful companies in the Silicon Valley.
6. Steven Jobs had the original idea to market the first personal computer.

7. King C. Gillette designed the first disposable razor blade.
8. A Frenchman named Benedictus introduced the idea of making safety glass in 1903 after he discovered a chemical that held broken glass together.
9. Martin Alpert devised many new products for the personal computer.
10. Martin Alpert's wife managed his business and marketed his products.

V. Describe the relationship between each of the following pairs of words (antonyms, synonyms, neither):

massive/small
cumbersome/awkward
expertise/innovation
muted/bright
anticipate/foresee
inevitable/avoidable
venture/risk
skeptical/unfriendly
potential/ability
donate/loan
collaborated/worked together
genuine/insincere
devise/invent
makeshift/permanent

VI. Choose the word to complete each of the following sentences:

1. Whenever the inventor was working on an innovation, she (emerged from/withdrew to) her house because she didn't want to be disturbed.
2. The new computer program was (collaborated/devised) by the newest student in the class.
3. The executives bought a (cumbersome/portable) copy machine because they needed to take it to meetings.
4. The computer enthusiast devised a portable model that had several practical (applications/markets) for educators.
5. It was Wozniak's (expertise/skepticism) that made it possible for him to devise the first personal computer.
6. The government (loaned/donated) $100 million to the corporation, expecting it to be repaid with 12 percent interest.
7. The investors (anticipated/intimidated) the higher profits because of the activity in the stock market.
8. When computers are not working, it is (inevitable/avoidable) that work will be delayed.

VII. Cross out the one word that does not have the same meaning as the other three words:

1. Everyone liked the computer salesman because he was (genuine/ calculating/ sincere/ unaffected) .
2. The corporation president (benefited/contributed/gave/donated) his services to the school of business.
3. The sudden decrease in sales was not (understood/ foreseen/ anticipated/ predicted) by anyone.
4. The corporate office of the manufacturing company was so close to the factory that the noise in the office was (muted/ vivid/ intense/ extreme).
5. There are many specialized (parts/ components/ contributors/ elements) in the memory bank of a computer.
6. The software company has the (capacity/ extent/ potential/ ability) to employ 500 people.
7. After the young investor earned a million dollars, he was highly regarded for his financial (skillfulness/ wizardry/ good fortune/ aptitude).
8. The software engineer's (expertise/ intelligence/ proficiency/ mastery) was limited to one area.
9. The computer-game business (celebrated/ thrived/ prospered/ progressed) during the summer months.
10. They undertook their (venture/ risky undertaking/ challenge/ decision) after making careful calculations.

VIII. Construct other sentences in this pattern (compound adjectives)

1. He is seeking a computer-related career.
2. Typewriter-sized computers became available in the 1970s to replace the room-sized computers of the 1960s.
3. Children tend to like sugar-based cereals.
4. Whereas an integrated circuit is thumbnail-sized, the vacuum tubes in earlier computers were cigar-sized.
5. We are shopping for a precision-built car.
6. They lived near a tree-edged lake.
7. Jobs and Wozniak were self-taught computer experts.

IX. In pairs or small groups, discuss each of the following questions:

1. Imagine that you just moved into an empty house. What can you use for a makeshift table? a makeshift pillow? a makeshift hammer?
2. Here are five gadgets found in many kitchens. Describe the functions of each: can opener, ice crusher, apple peeler, cheese grater. Name some other gadgets that are found in many kitchens.
3. If you were to design a state-of-the-art product, how would you improve the following products: toothbrush, bathtub, notebook, hairbrush?
4. Which of the following do you find intimidating? Why? (a teacher, a large truck on the road, a policeman, an automatic bank teller, a school counselor, a telephone-answering machine)
5. What marketing techniques would you use if you wanted to sell a new soft drink product? What market would you focus on?
6. Which would be preferable for each of the following buildings, muted colors or bright? Why? (a restaurant, a post office, a hospital a high school, a music store, a day-care center)
7. What are the components of each of the following: a good marriage? a modern kitchen? a good stereo system?
8. Describe another entrepreneur whose investments led to fame and fortune.
9. Under what circumstances does a business thrive? a tree? a young child? a marriage?
10. Name a notable pioneer in each of the following fields. (manufacturing, science, art, architecture, medicine, social services)
11. What is a practical application of the personal computer in business? In the home?

X. Complete the paragraph below:

Although Jobs and Wozniak have become known as two of the most brilliant innovators in the technological revolution, not all of their (1) ... were as successful as the Apple I and the Apple II. They (2) ... the Apple II Plus in 1980 when they (3) ... that small businesses would have a need for a more professional and integrated system than the Apple I or II. The Apple II Plus was an advanced version of the Apple II that they aimed at the small business (4) ... Unfortunately, they did not (5) ... the competition of the IBM Personal Computer. Although IBM was not the original (6) ... of the personal computer, they had been the leader in the business machine industry for several decades, and

they soon (7) ... as the primary competition in the personal computer (8) ... IBM had many advantages over Apple: their engineering was done by a more experienced engineering staff, and their advertising was done by their more experienced (9) ... staff. Since Apple had been so successful with the Apple I and the Apple II, the failure of their (10) ... with the Apple II Plus was both (11) ... and disappointing.

TEXT II. DEEP BLUE

(1) Special-purpose machines, DEEP BLUE and its predecessor DEEP THOUGHT, were originally created to explore how to use parallel processing to solve complex problems. DEEP THOUGHT was a first computer to defeat a chess grandmaster, thanks to its ability to analyze 750,000 positions per second. But in 1990, an experimental 6-processor version of DEEP THOUGHT, capable of searching 2 million positions per second, played against Kasparov and lost. Kasparov went on to defeat DEEP BLUE by winning 3 games and 2 draws. Six IBM employees used a hefty machine to win a chess game against the reigning world champion in the rematch in 1997. No other tool of human invention could leverage their talents so magnificently. DEEP BLUE now has the ability to calculate 50 to 100 billion moves within 3 minutes. But DEEP BLUE is not mimicking human thought. It does not anticipate, it only reacts. DEEP BLUE is a 32-node IBM power Parallel SP2 high performance computer. Each node of the SP2 employs a single microchannel card containing 8 dedicated VLSI chess processors for a total of 256 processors working in tandem. DEEP BLUE's programming code is developed in C and runs under the AIX operating system.

(2) To the uninformed advanced technology is indistinguishable from magic. We must continue to develop these machines and methods of harnessing them to human needs. Computers amplify our cognitive and reasoning abilities.

EXERCISES

I. True or false?

1. The Intelligent Computer is amyth.
2. It were actually Deep Blue's designers, programmers, and builders who had beaten Kasparov, not the machine itself.

3. The world will be overtaken by silicon-based life forms.
4. Chess playing is to logic and calculation what intelligence is to relationships and negotiations.
5. Chess is social; intelligence is abstract.
6. The Deep Blue has inhuman logico-mathematical capability.
7. There are 7 dimensions of intelligence: linguistic, logico-mathematical, spatial, musical, kinesthetic, intrapersonal, and interpersonal.
8. The Deep Blue has all these dimensions.
9. "Any sufficiently advanced technology is indistinguishable from magic". (A.C. Clarke)

II. Translate into English:

НАСТУПЛЕНИЕ ПЕРСОНАЛЬНЫХ КОМПЬЮТЕРОВ

В 70-е годы появляются персональные компьютеры. Прежде всего, Apple. Компьютер пришел к человеку. И хотя мощность первых Apple была несравнимо меньше, чем у IBM, компьютер стал ближе и понятнее. Кстати, именно тогда были реализованы основные принципы многооконного интерфейса, которые позднее будут восприняты оболочкой Windows. Компьютер стал «думать» о человеке, о его удобствах, а не только о том, как бы быстрее посчитать. От последовательности, когда человек готовит задание, а компьютер задание выполняет, был совершен переход к параллельной работе человека и компьютера.

Фирма IBM, как и всякая огромная империя, оказалась очень неповоротлива: поначалу она даже не обратила внимания на персональный компьютер. Но когда объемы продаж Apple стали обвально нарастать, в IBM постепенно поняли, что упускают совершенно новый сегмент рынка. Последовал «огромный неуклюжий скрипучий поворот руля», и вместе с Microsoft IBM выбросила на рынок миллион (sic) компьютеров PC. Это произошло в 1981 году. Тогда и началась современная компьютерная эра. В этот некруглый год компьютер вошел в офисы и дома и расположился там, наверное, навсегда.

Это период резвого младенчества персональных компьютеров. Операционные системы возникают десятками. Чуть ли не каждая компания, производившая компьютеры, считала долгом чести создать свою. Основным языком программирования стал

Бейсик — язык очень простой и доступный. Всякий человек, посвятивший пару месяцев его изучению, мог считать себя умудренным и многоопытным «гуру». Тогда же были созданы электронные таблицы и текстовые редакторы — весьма удобные, истинно персональные инструменты. Никакого общего стандарта не было, и еще не просвечивала сквозь каждое приложение лукавая улыбка Билла Гейтса.

Появились компьютерные игры, и самая знаменитая из них — «Тетрис». Однако, как только сделалось понятно, что персональный компьютер не только игрушка, что он может реально работать, потребовался стандарт и взаимная совместимость программ, процессоров, систем хранения информации, резко возросли требования к квалификации программиста и надежности «железа», многие фирмы разорились, другие ушли в тень мощных конкурентов. Ситуация стабилизировалась, и компьютерный мир приобрел вполне оформленные очертания.

III. Find an article about a business venture. Prepare to describe that venture in class.

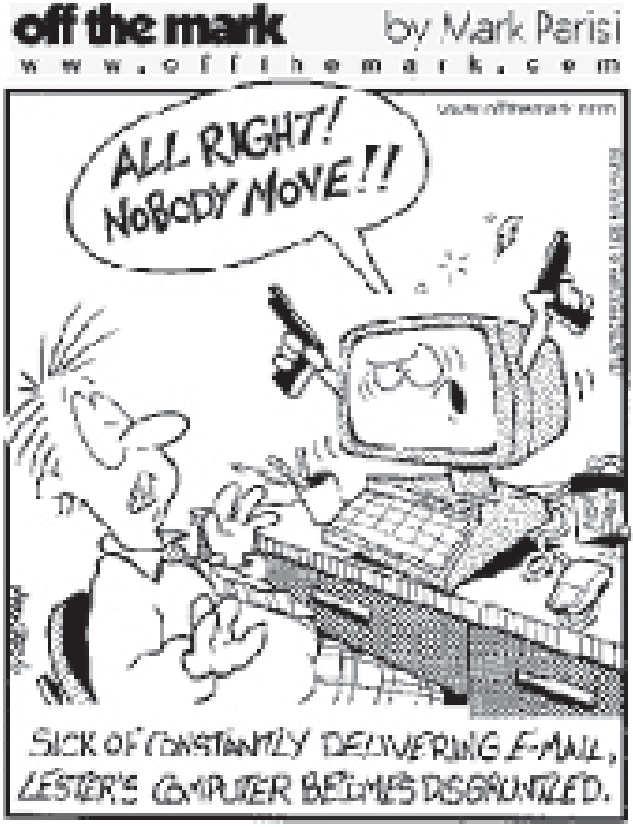
IV. Read the following paragraph as manytimes as you can in 3 minutes. Then rewrite as much info as you can remember.

By 1987 the computer market on American college campuses was thriving. Sales people from all the personal computer companies were actively pursuing the business of college administrators, professors and officials. They were selling computers less than half price and were adding attractive bonuses such as free software and support services. They were willing to venture a great deal of time and money in this market because they foresaw that it would thrive for a long time. There are 14 million people who provide or receive education on campuses, including 12.5 million new freshmen every year. Students who also buy computers are likely to become lifetime customers who may enter business after graduation and influence corporate buying decisions.

Topics for Essays, Oral or Written reports

1. Describe a kitchen gadget that you think should be invented. What would it do? Who would buy it? How should it be marked?
2. How has the world benefited from the invention of the PC? What problems have accompanied the computer revolution?
3. Of all advantages that the computer has brought to the modern world, which is the most beneficial?
4. Describe the invention that has had the greatest effect on the 20th century.

Unit V.
Computer and Crime



Prereading Discussion

1. What is the Russian for hacker?
2. Are hackers good or bad?
3. What examples of computer abuse do you know?
4. What are the reasons for computer crime?

Reading Analysis

VOCABULARY LIST

***Nouns**: freshman, access to, authority, reign, pride, innovation, bogus, endeavor, exhilaration, insights.*
***Verbs**: to encompass, to promote.*
***Adjectives**: bonafide, awe-inspiring, mere, efficient.*

TEXT I. THE FIRST HACKERS

(1) The first "hackers" were students at the Massachusetts Institute of Technology (MIT) who belonged to the TMRC (Tech Model Railroad Club). Some of the members really built model trains. But many were more interested in the wires and circuits underneath the track platform. Spending hours at TMRC creating better circuitry was called "a mere hack." Those members who were interes-ted in creating innovative, stylistic, and technically clever circuits called themselves (with pride) *hackers.*

(2) During the spring of 1959, a new course was offered at MIT, a freshman programming class. Soon the hackers of the railroad club were spending days, hours, and nights hacking away at their computer, an IBM 704. Instead of creating a better circuit, their hack became creating faster, more efficient program — with the least number of lines of code. Eventually they formed a group and created the first set of hacker's rules, called the Hacker's Ethic.

(3) Steven Levy, in his book *Hackers*, presented the rules:

- R*ule 1: Access to computers — and anything, which might teach you, something about the way the world works — should be unlimited and total.*
- *Rule 2: All information should be free.*
- *Rule 3: Mistrust authority — promote decentralization.*
- *Rule 4: Hackers should be judged by their hacking, not bogus criteria such as degrees, race, or position.*
- *Rule 5: You can create art and beauty on a computer.*
- *Rule 6: Computers can change your life for the better.*

(4) These rules made programming at MIT's Artificial Intelligence Laboratory a challenging, all encompassing endeavor. Just for the exhilaration of programming, students in the AI Lab would write a new program to perform even the smallest tasks. The program would be made available to others who would try to perform the same task with fewer instructions. The act of making the computer work more elegantly was, to a bonafide hacker, awe-inspiring.

(5) Hackers were given free reign on the computer by two AI Lab professors, "Uncle" John McCarthy and Marvin Minsky, who realized that hacking created new insights. Over the years, the AI Lab created many innovations: LIFE, a game about survival; LISP, a new kind of programming language; the first computer chess game; The CAVE, the first computer adventure; and SPACEWAR, the first video game.

EXERCISES

I. True or false?

1. Those who can, do. Those who cannot, teach. Those who cannot teach, HACK!
2. The first hackers were interested in railroad circuitry.
3. The first hackers studied at MIT.
4. The point of a hacker's work was to create a faster and smaller code.
5. Hackers had their own Ethic Code.
6. TMRC stands for Toy Machinery Railroad Car.
7. Hackers sabotaged the work of the AI Lab.
8. An elegant computer was, to a real hacker, awe-inspiring.
9. At AI Lab hackers wrote a computer program for every other task.
10. Hackers were quite prolific in innovations.
11. Hackers were given free reign on the two AI Lab professors.

II. Put the proper words into sentences:

programming, insights, innovation, ethic, instructions, exhilaration, endeavor, awe-inspiring, encompass, freshmen, authority, bogus, mistrust.

1. Decentralization results in ... to the chief.
2. Holding the door for a lady is the question of...
3. This still life isn't Picasso's; it's a...
4. The report you've presented doesn't ... some of the problems.

5. If you can survive both in the jungle and the desert, a ... Indian you are.
6. The ... in how hardware works is obligatory for a good programmer.
7. Each ... is another step to a new technological revolution.
8. In 1961 the Soviet Scientists' ... to conquer the space was a success.
9. ... without any reason proves one's carelessness.
10. Iron grip boss expects you to carry out all his ...
11. Annually MIT gains over 5000 ...
12. ... should cause ... terror in your heart.

TEXT II. COMPUTER CRIMES

(1) More and more, the operations of our businesses, governments, and financial institutions are controlled by information that exists only inside computer memories. Anyone clever enough to modify this information for his own purposes can reap substantial rewards. Even worse, a number of people who have done this and been caught at it have managed to get away without punishment.

(2) These facts have not been lost on criminals or would-be criminals. A recent Stanford Research Institute study of computer abuse was based on 160 case histories, which probably are just the proverbial tip of the iceberg. After all, we only know about the unsuccessful crimes. How many successful ones have gone undetected is anybody's guess.

(3) Here are a few areas in which computer criminals have found the pickings all too easy.

(4) **Banking**. All but the smallest banks now keep their accounts on computer files. Someone who knows how to change the numbers in the files can transfer funds at will. For instance, one programmer was caught having the computer transfer funds from other people's accounts to his wife's checking account. Often, traditionally trained auditors don't know enough about the workings of computers to catch what is taking place right under their noses.

(5) **Business**. A company that uses computers extensively offers many opportunities to both dishonest employees and clever outsiders. For instance, a thief can have the computer ship the company's products to addresses of his own choosing. Or he can have it issue checks to him or his confederates for imaginary supplies or services. People have been caught doing both.

(6) **Credit Cards**. There is a trend toward using cards similar to credit cards to gain access to funds through cash-dispensing terminals.

Yet, in the past, organized crime has used stolen or counterfeit credit cards to finance its operations. Banks that offer after-hours or remote banking through cash-dispensing terminals may find themselves unwillingly subsidizing organized crime.

(7) **Theft of Information**. Much personal information about individuals is now stored in computer files. An unauthorized person with access to this information could use it for blackmail. Also, confidential information about a company's products or operations can be stolen and sold to unscrupulous competitors. (One attempt at the latter came to light when the competitor turned out to be scrupulous and turned in the people who were trying to sell him stolen information.)

(8) **Software Theft**. The software for a computer system is often more expensive than the hardware. Yet this expensive software is all too easy to copy. Crooked computer experts have devised a variety of tricks for getting these expensive programs printed out, punched on cards, recorded on tape, or otherwise delivered into their hands. This crime has even been perpetrated from remote terminals that access the computer over the telephone.

(9) **Theft of Time-Sharing Services**. When the public is given access to a system, some members of the public often discover how to use the system in unauthorized ways. For example, there are the "phone freakers" who avoid long distance telephone charges by sending over their phones control signals that are identical to those used by the telephone company.

(10) Since time-sharing systems often are accessible to anyone who dials the right telephone number, they are subject to the same kinds of manipulation.

(11) Of course, most systems use account numbers and passwords to restrict access to authorized users. But unauthorized persons have proved to be adept at obtaining this information and using it for their own benefit. For instance, when a police computer system was demonstrated to a school class, a precocious student noted the access codes being used; later, all the student's teachers turned up on a list of wanted criminals.

(12) **Perfect Crimes**. It's easy for computer crimes to go undetected if no one checks up on what the computer is doing. But even if the crime is detected, the criminal may walk away not only unpunished but with a glowing recommendation from his former employers.

(13) Of course, we have no statistics on crimes that go undetected. But it's unsettling to note how many of the crimes we do know

about were detected by accident, not by systematic audits or other security procedures.The computer criminals who have been caught may have been the victims of uncommonly bad luck.

(14) For example, acertain keypunch operator complained of having to stay overtime to punch extracards.Investigation revealed that the extracards she was being asked to punch were for fraudulent transactions.In another case, disgruntled employees of the thief tipped off the company that was being robbed.An undercover narcotics agent stumbled on still another case.An employee was selling the company's merchandise on the side and using the computer to get it shipped to the buyers.While negotiating for LSD, the narcotics agent was offered agood deal on astereo!

(15) Unlike other embezzlers, who must leave the country, commit suicide, or go to jail, computer criminals sometimes brazen it out, demanding not only that they not be prosecuted but also that they be given good recommendations and perhaps other benefits, such as severance pay.All too often, their demands have been met.

(16) Why? Because company executives are afraid of the bad publicity that would result if the public found out that their computer had been misused.They cringe at the thought of acriminal boasting in open court of how he juggled the most confidential records right under the noses of the company's executives, accountants, and security staff.And so another computer criminal departs with just the recommendations he needs to continue his exploits elsewhere.

EXERCISES

I. Find in the text the English equivalents to:

избежать наказания; потенциальные преступники; злоупотребление компьютером; пресловутая верхушка айсберга; остаться необнаруженным; можно только догадываться; хранить счета; переводить по желанию; воображаемые поставки; получить доступ к; обналичивание (денег); фальшивые электронные карточки; субсидировать организованную преступность; кража информации; шантаж; нещепетильные конкуренты; разработать множество трюков; телефонные мошенники; плата за междугородние звонки; набрать телефонный номер; ограничить доступ; лица без права доступа; разыскиваемые преступники; случайно; проверки; меры безопасности; тайный агент.

II. True or false?

1. A person is innocent until proven guilty.
2. Computer-related crime has diminished.
3. A thief can transfer funds from other people's accounts.
4. Dishonest employees can't ship the company's products to addresses of their choosing.
5. It is impossible to counterfeit credit cards.
6. Phone freaks can be found out.
7. Personal information should not be stored in computer files.
8. A real bank checks very carefully before handling out any money.
9. Unauthorized persons have proved to be inefficient laymen.
10. Hardware is less expensive than software.
11. Computer criminals will never be caught.
12. Companies don't punish some criminals because they don't want bad publicity.

III. Give synonyms to:

to come to light; confidential; attempt; crooked; to deliver; to perpetrate crime; freaks; to avoid; to obtain; to reveal; merchandise; transaction; severance pay; publicity; executive.

IV. Give antonyms to:

fraudulent; common; to ship; like; to go to jail; to be adept at; to reveal; a precocious student; former; by accident; to complain of.

V. Construct other sentences in these patterns (transitional expressions):

1. After all, we know only about unsuccessful crimes.
2. All but the smallest banks keep their accounts in computer files.
3. Yet, in the past, organized crime used stolen credit cards to finance its operations.
4. Also, confidential information can be stolen.
5. For example, three phone freakers who avoid paying distance telephone charges.
6. Of course, most systems use passwords to restrict access to authorized users.
7. Unlike other embezzlers, computer criminals demand that they be given good recommendations.

8. All too often, their demands have been met.
9. So, another criminal continues his exploits elsewhere.

VI. Translate into English.

ХАКЕРЫ: ПЛОХИЕ ИЛИ ХОРОШИЕ?

Слово *хакер* совмещает в себе, по крайней мере, два значения (один дотошный хакер насчитал целых 69): одно — окрашенное негативно (*взломщик*), другое — нейтральное или даже хвалебное (*ас*, *мастер*).

Английский глагол *to hack* применительно к компьютерам может означать две вещи — взломать систему или починить ее. Воснове этих действий лежит общая основа: понимание того, как устроен компьютер, и программы, которые на нем работают.

В 1984 году Стивен Леви в своей знаменитой книге *Хакеры: Герои компьютерной революции* сформулировал принципы *хакерской этики*:

Доступ к компьютерам должен быть неограниченным и полным.
Вся информация должна быть бесплатной.
Не верь властям — борись за децентрализацию.
Ты можешь творить на компьютере искусство и красоту.
Компьютеры могут изменить твою жизнь к лучшему.

Всвоей книге Леви говорит о трех поколениях хакеров. Первое возникло в шестидесятых годах — начале семидесятых на отделениях компьютерных наук в университетах. Используя технику *разделения времени*, эти парни преобразовали *компьютеры общего пользования* (mainframes) в виртуальные персональные компьютеры.

В конце 70-х второе поколение делает следующий шаг — изобретение и производство персональных компьютеров. Эти неакадемические хакеры были яркими представителями контркультуры. Например, Стив Джобс, хиппи-битломан, бросивший колледж, или Стив Возняк, инженер в «Hewlett-Packard». Прежде чем преуспеть в «Apple», оба Стива занимались тем, что собирали и продавали так называемые *голубые коробки* — приспособления, позволяющие бесплатно звонить по телефону.

Руководствуясь той же *хакерской этикой*, что и предыдущие поколения, они противостоят коммерциализации Internet, создавая программы, которые тут же становятся доступны всякому, кто их пожелает, — так называемые *freeware* или *shareware*.

Третье поколение киберреволюционеров, хакеры начала 80-х, создало множество прикладных, учебных и игровых программ для персональных компьютеров. Типичная фигура — Мич Кейпор, бывший учитель трансцендентальной медитации, создавший программу «Lotus 1-2-3», которая весьма способствовала успеху компьютеров IBM.

За годы, прошедшие с выхода книги Леви, к власти пришло четвертое поколение революционеров. Именно они преобразовали милитаристскую Arpanet в *тотальную дигитальную эпидемию*, известную ныне как Internet.

Плохие хакеры — читают чужие письма, воруют чужие программы и всеми доступными способами вредят прогрессивному человечеству.

Topics for Essays, Oral or Written Reports

1. A day in a hacker's life.
2. Hackers of today.
3. If I were a hacker
4. Hacking for fun or running for life?
5. Do we need hackers?

Essay Selection for Reading as a Stimulus for Writing

HACKERS OF TODAY

Hackers, having started as toy railroad circuitry designers in the late fifties, are completely new people now. Once turned to computers, they became gods and devils. Nowadays holders and users of the World Wide Web hide their PCs under passwords when the keyword "hacker" is heard. When and how did this change take place? Why are we so frightened of Hacker The Mighty and The Elusive?

One of the legends says that hackers have changed under the influence of "crackers" — the people who loved to talk on the phone at somebody else's

expense. Those people hooked up to any number and enjoyed the pleasure of telephone conversation,leaving the most fun— bills— for the victim. Another legend tells us that modern hackers were born when a new computer game concept was invented. Rules were very simple: two computer programs were fighting for the reign on the computer. Memory,disk-space and CPU time were the battlefield. The results of that game are two in number and are well known: hackers and computer viruses. One more story tells that the "new" hackers came to existence when two MIT students that attended the AI Lab found an error in a network program. They let people,responsible for the network,know but with no result. The offended wrote a code that completely paralyzed the network and only after that the error was fixed. By the way,those students founded The Motorola Company later.

Today,when the Internet has entered everyone's house there's no shield between a hacker and your PC. You can password yourself up,but then either hackers will crack your PC anyway or nobody will enter your site, because passwords kill accessibility. If your PC is easy to access no one can guarantee what'll happen to your computer - hackers,you know them.

Monsters? Chimeras? Not at all! Every hacker is a human being and has soft spots: good food,pretty girls or boys (it happens both ways),classical music,hot chocolate at the fireplace,apple pie on Sunday. Hacker is first of all a connoisseur,a professional with no computer secret out of his experience. And what is the application for skills depends on him,God,and Holy Spirit.

Unit VI.
Computer Security

Prereading Discussion

1. What are some common motivations for computer crime?
2. What is computer security?
3. What threatens acomputer system?
4. Was the first *bug* real?
5. What viruses do you know?
6. What does biometrics study?
7. What is cryptography?

Reading Analysis

VOCABULARY LIST

***Nouns**: ransom,theft,espionage,imposter,forgery,advocate,fingerprints, distortion,purchase,vendor.*
***Verbs**: safeguard, entitle, claim, arise, encrypt, evade, circumvent, override.*
***Adjectives**: vulnerable,legitimate,thorough,distinct,promising,plain, secure,particular.*
***Word combinations**: white-collar crime,to keep secret,under way, by chance,needless to say,security provisions,credit card holder,at the intersection of.*

TEXT I. SECURITY: PLAYING IT SAFE

(1) The computer industry has been extremely vulnerable in the matter of security. Computer security once meant the physical security of the computer itself — guarded and locked doors. Computer screens were given dark filters so others could not easily see the data on the screen. But filters and locks by no means prevented access. More sophisticated security means safeguarding the computer system against such threats as burglary, vandalism, fire, natural disasters, theft of data for ransom, industrial espionage, and various forms of white-collar crime.

(2) **Emphasis on Access and Throughput.** For the last decade or so, computer programmers have concentrated on making it easy for people to use computer systems. Unfortunately, in some situations the systems are all too easy to use; they don't impose nearly enough restrictions to safeguard confidential information or to prevent unauthorized persons from changing the information in a file.

(3) It's as if a bank concentrated all its efforts on handing out money as fast is it could and did very little to see that the persons who requested the money were entitled to it. Of course, a real bank works just the opposite way, checking very carefully before handing out any money. Computer systems that handle sensitive personal and financial data should be designed with the same philosophy in mind.

(4) **Positive Identification of Users**. A computer system needs a sure way

of identifying the people who are authorized to use it. The identification procedure has to be quick, simple, and convenient. It should be so thorough that there is little chance of the computer being fooled by a clever imposter. At the same time, the computer must not reject legitimate users. Unfortunately, no identification system currently in use meets all these requirements.

(5) At present, signatures are widely used to identify credit-card holders, but it takes an expert to detect a good forgery. Sometimes even a human expert is fooled, and there is no reason to believe that a computer could do any better.

(6) A variation is to have the computer analyze a person's hand movements as he signs his name instead of analyzing the signature itself. Advocates of this method claim that different persons' hand movements are sufficiently distinct to identify them. And while a forger might learn to duplicate another person's signature, he probably would not move his hand exactly the way the person whose signature he was forging did.

(7) Photographs are also sometimes used for identification. But, people find it inconvenient to stop by a bank or credit card company and be photographed. Companies might lose business if they made the pictures an absolute requirement. Also, photographs are less useful these days, when people frequently change their appearance by changing the way they wear their hair. Finally, computer programs for analyzing photographs are still highly experimental.

(8) Cash-dispensing systems often use two identification numbers: one is recorded on a magnetic stripe on the identification card, and the other is given to the cardholder. When the user inserts his card into the cash-dispensing terminal, he keys in the identification number he has been given. The computer checks to see that the number recorded on the card and the one keyed in by the user both refer to the same person. Someone who stole the card would not know what number had to be keyed in to use it. This method currently is the one most widely used for identifying computer users.

(9) For a long time, fingerprints have provided a method of positive identification. But they suffer from two problems, one technical and one psychological.

(10) The technical problem is that there is no simple system for comparing fingerprints electronically. Also, most methods of taking fingerprints are messy. The psychological problem is that fingerprints

are strongly associated in the public mind with police procedures. Because most people associate being fingerprinted with being arrested, they almost surely would resist being fingerprinted for routine identification.

(11) Voiceprints may be more promising. With these, the user has only to speak a few words into a microphone for the computer to analyze his voice. There are no psychological problems here. And technically it's easier to take and analyze voiceprints than fingerprints. Also, for remote computer users, the identifying words could be transmitted over the telephone.

(12) However, voiceprints still require more research. It has yet to be proved that the computer cannot be fooled by mimics. Also, technical difficulties arise when the voice is subjected to the noise and distortion of a telephone line.

(13) Even lip prints have been suggested. But it's doubtful that kissing computers will ever catch on.

(14) To date, the most reliable method of positive identification is the card with the magnetic stripe. If the technical problems can be worked out, however, voiceprints may prove to be even better.

(15) **Data Encryption**. When sensitive data is transmitted to and from remote terminals, it must be **encrypted** (translated into a secret code) at one end and **decrypted** (translated back into plain text) at the other. Files also can be protected by encrypting the data before storing it and decrypting it after it has been retrieved.

(16) Since it is impractical to keep secret the algorithms that are used to encrypt and decrypt data, these algorithms are designed so that their operation depends on a certain data item called the key. It is the key that is kept secret. Even if you know all the details of the encrypting and decrypting algorithms, you cannot decrypt any messages unless you know the key that was used when they were encrypted.

(17) For instance, the National Bureau of Standards has adopted an algorithm for encrypting and decrypting the data processed by federal agencies. The details of the algorithm have been published in the **Federal Register**. Plans are under way to incorporate the algorithm in special purpose microprocessors, which anyone can purchase and install in his computer.

(18) So the algorithm is available to anyone who bothers to look it up or buy one of the special purpose microprocessors. But the operation of the algorithm is governed by a sixty-four-bit key. Since there are

about 10^{22} possible sixty-four-bit keys, no one is likely to discover the correct one by chance. And, without the correct key, knowing the algorithm is useless.

(19) A recent important development involves what are called **public-key cryptosystems**.

(20) In a public-key cryptosystem, each person using the system has two keys, a public key and a private key. Each person's public key is published in a directory for all to see; each person's private key is kept secret. Messages encrypted with a person's public key can be decrypted with that person's (but no one else's) private key. Messages encrypted with a person's private key can be decrypted with that person's (but no one else's) public key.

(21) **Protection through Software**. The software of a computer system, particularly the operating system, can be designed to prevent unauthorized access to the files stored on the system.

(22) The protection scheme uses a special table called a *security matrix*.

	Data A	Data B	Data C
User A	Read Modify Execute	Modify	Read
User B	Read	Modify Execute	Modify
User C	Read Modify	Read Execute	Read

(23) Each row of the security matrix corresponds to a data item stored in the system. Each entry in the table lies at the intersection of a particular row and a particular column. The entry tells what kind of access the person corresponding to the row in which the entry lies has to the data item corresponding to the column in which the entry lies.

(24) Usually, there are several kinds of access that can be specified. For instance, a person may be able to read a data item but not change it. Or he may be able to both read and modify it. If the data is a program, a person may be able to have the computer execute the program

without being able either to read or modify it. Thus, people can be allowed to use programs without being able to change them or find out how they work.

(25) Needless to say, access to the security matrixitself must be restricted to one authorized person.

(26) Also, the software has to be reliable. Even the software issued by reputable vendors may be full of bugs.One or more bugs may make it possible for aperson to circumvent the security system.The security provisions of more than one computer system have been evaded by high school and college students.

(27) **Restricting the Console Operator**. Most computer systems are extremely vulnerable to the console operator. That's because the operator can use the switches on the computer's control panel to insert programs of his own devising, to read in unauthorized programs, or to examine and modify confidential information, including the security matrix. In the face of these capabilities, any software security system is helpless.Computer systems for handling sensitive information must be designed so that the console operator, like other users, works through the software security system and cannot override it.One solution is to incorporate the security system in firmware instead of software, so that unauthorized changes to it cannot be made easily.

EXERCISES

I. Give synonyms to:

To encrypt, to secure, confidential, biometric, recognition, imposter, to meet requirements, to detect, to lose business, appearance, to incorporate, unless, to circumvent.

II. Give antonyms to:

Convenient, advocate, to reject, to encrypt, legitimate, messy, authorized, white-collar crime, to safeguard info, sensitive, to retrieve data, practical, by chance, private.

III. Answer the questions:

1. What is computer security?

2. What is the most serious problem: the loss of hardware, software, or the loss of data?
3. How does a computer system detect whether you are the person who should be granted access to it?
4. What are the shortcomings of each biometric means?
5. What is to prevent any user from copying PC software onto diskettes?
6. What steps can be taken to prevent theft or alteration of data?
7. What is the weakest link in any computer system?
8. Should a programmer also be a computer operator?
9. What is a security matrix?
10. Can the computer industry risk being without safeguards for security and privacy?

IV. Put the proper words into sentences:

foolproof, complicated, virus, unauthorized, crime, fingerprint, altering, messages.

1. Computer security is more ... today than it was in the past.
2. International literature tells lurid stories about computer viruses ... — about bank swindles, espionage, ... sent from one computer to destroy the contents of others.
3. Movies like War Games have dramatized the dangers from ... entry to the computer systems that control nuclear weapons.
4. Methods used in computer-based criminal activity range from switching or ... data as they enter the computer, to pulling self-concealing instruction into the software.
5. The person who develops a ... lock for the computer data will make a fortune.
6. ... is the name generally given to software that causes ... of computer files.
7. People must be taught that some kinds of help, such as assisting ... users with passwords are inappropriate.
8. According to a published article, the Mafia has kidnapped an IBM executive and cut off his finger because it needed his ... to breach a computer security system.
9. Data sent over communication lines can be protected by encryption, the process of scrambling ...
10. Firewall is security measures taken to block ... access to an Internet site.

V. Construct other sentences of these patterns:

1. All these systems are too easy to use.
2. It's as if a bank concentrated all its efforts on handing out money as fast as it could.
3. The identification procedure has to be quick and simple.
4. It takes an expert to detect a good forgery.
5. The voice is subjected to the noise and distortion of a telephone line.
6. It is the key that is kept secret.
7. You cannot decrypt any message unless you know the key.
8. No one is likely to discover the correct algorithm by chance.
9. The security system is incorporated in firmware, so that unauthorized changes to it cannot be made easily.
10. Suppose I want to send you a signed message.

TEXT II. CHECKING YOUR OWN SECURITY

A Personal Checklist for Hardware. With the subject of security fresh in your mind, now is a good time to consider a checklist for your own personal computer and its software. We will confine this list to a computer presumed to be in the home.

1. No eating, drinking, or smoking near the computer.
2. Do not place the computer near open windows or doors.
3. Do not subject the computer to extreme temperatures.
4. Clean equipment regularly.
5. Place a cable lock on the computer.
6. Use a surge protector.
7. Store diskettes properly in a locked container.
8. Maintain backup copies of all files.
9. Store copies of critical files off site.

A Personal Checklist for Software. A word of prevention is in order. Although there are programs that can prevent virus activity, protecting yourself from viruses depends more on common sense than on building a "fortress" around the computer. Here are a few common-sense tips:

1. If your software allows it, follow write-protect measures for your floppy disks before installing any new software. If it does not allow it, write-protect the disks immediately after installation.

2. Do not install software unless you know it is safe. Viruses tend to show up on free software acquired from sales representatives, resellers, computer repair people, power users, and consultants.
3. Make your applications (and other executable files) read-only. This will not prevent infection, but it can help contain those viruses that attack applications.
4. Stop the so-called sneakernet crowd. This is the group that moves around the office (in sneakers, of course) and prefers to transfer files quickly via floppy disk.
5. Make backups. This is a given: Always back up your hard disk and floppies.

EXERCISES

I. Find in the text the English equivalents to:

давно пора; тема безопасности; перечень; подвергать; резервные копии; блокировка питания; защита от выброса; выполняемый файл; здравый смысл; защитить данные в отдельном файле или на целом диске; только для чтения; помешать заражению; с помощью; передавать файл.

II. Answer the following questions:

1. What are security devices?
2. What can help minimize theft?
3. What can a surge protector do?
4. Why is the so-called sneakernet crowd dangerous?

III. Translate into English:

1. Еще в школе Билл Гейтс сумел подобрать ключ к системе защиты и постоянно воровал время эксплуатации машины.
2. Нарушение авторского права — незаконное копирование, в частности, программы.
3. Пароль — это набор символов, используемых в качестве кода к вычислительной системе или базе данных. Компьютерные хулиганы могут легко подобрать пароль, если он представляет собой инициалы или последовательные ряды чисел.

4. Знаете ли вы, как вести себя в Интернете? Существует ли этика Сетевого Братства?
5. Тащат все: личные коды кредитных карточек, авторские музыкальные произведения, последние компьютерные игры. Хакеры называют это дележкой, остальное — откровенным воровством.
6. Легальный компьютерный бизнес поднимается на свою защиту.
7. Если вы используете компьютер в своем бизнесе, то вы должны иметь антивирусные программы и обновлять их постоянно.
8. Есть два способа избежать заражения компьютерными вирусами: не устанавливать новое программное обеспечение без проверки и не загружать бесплатную информацию из сети.
9. Самыми быстрыми способами нелегального распространения программного обеспечения сейчас являются: воровство, взлом и торговля краденым.

Related Reading

VIRUSES AND VACCINES

The terms *viruses* and *vaccines* have entered the jargon of the computer industry to describe some of the bad things that can happen to computer systems and programs. Unpleasant occurrences like the March 6, 1991, attack of the Michelangelo virus will be with us for years to come. In fact, from now on you need to check your IBM or IBM-compatible personal computer for the presence of Michelangelo before March 6 every year — or risk losing all the data on your hard disk when you turn on your machine that day. And Macintosh users need to do the same for another intruder, the Jerusalem virus, before each Friday the 13th, or risk a similar fate for their data.

A virus, as its name suggests, is contagious. It is a set of illicit instructions that infects other programs and may spread rapidly. The Michelangelo virus went worldwide within a year. Some types of viruses include the *worm*, a program that spreads by replicating itself; the *bomb*, a program intended to sabotage a computer by triggering damage based on certain conditions — usually at a later date; and the *Trojan horse*, a program that covertly places illegal, destructive instructions in the middle of an otherwise legitimate program. A virus may be dealt with by means

of a *vaccine*, or *antivirus*, program, a computer program that stops the spread of and often eradicates the virus.

Transmitting a Virus. Consider this typical example. A programmer secretly inserts a few unauthorized instructions in a personal computer operating system program. The illicit instructions lie dormant until three events occur together: 1. the disk with the infected operating system is in use; 2. a disk in another drive contains another copy of the operating system and some data files; and 3. a command, such as COPY or DIR, from the infected operating system references a data file. Under these circumstances, the virus instructions are now inserted into the other operating system. Thus the virus has spread to another disk, and the process can be repeated again and again. In fact, each newly infected disk becomes a virus carrier.

Damage from Viruses. We have explained how the virus is transmitted; now we come to the interesting part — the consequences. In this example, the virus instructions add 1 to a counter each time the virus is copied to another disk. When the counter reaches 4, the virus erases all data files. But this is not the end of the destruction, of course; three other disks have also been infected. Although viruses can be destructive, some are quite benign; one simply displays a peace message on the screen on a given date. Others may merely be a nuisance, like the Ping-Pong virus that bounces a "Ping-Pong ball" around your screen while you are working. But a few could result in disaster for your disk, as in the case of Michelangelo.

Prevention. A word about prevention is in order. Although there are programs called vaccines that can prevent virus activity, protecting your computer from viruses depends more on common sense than on building a "fortress" around the machine. Although there have been occasions where commercial software was released with a virus, these situations are rare. Viruses tend to show up most often on free software acquired from friends. Even commercial bulletin board systems, once considered the most likely suspects in transferring viruses, have cleaned up their act and now assure their users of virus-free environments. But not all bulletin board systems are run professionally. So you should always test diskettes you share with others by putting their write-protection tabs in place. If an attempt is made to write to such a protected diskette, a warning message appears on the screen. It is not easy to protect hard disks, so many people use antivirus programs. Before any diskette can be used with a computer system, the antivirus program scans the diskette for infection. The drawback is that once you buy this type of software,

you must continuously pay the price for upgrades as new viruses are discovered.

Topics for Essays, Oral or Written Reports:

1. Which of user identifications is best?
2. Common means of protecting data:
   - securing waste;
   - separating employee functions;
   - implementing passwords, internal controls, audit checks.
3. Cryptography.
4. Copy protection;
5. What are computer viruses and how do they differ?
6. What makes a *perfect* virus?
7. A day in the life of the *virus hunter*.
8. Professional ethical behavior.

Essay Selection for Reading as a Stimulus for Writing

WHOM TO BLAME AND WHAT TO DO?

As computing and communications become irreplaceable tools of modern society, one fundamental principle emerges: the greater the benefits these systems bring to our well-being and quality of life, the greater the potential for harm when they fail to perform their functions or perform them incorrectly. Consider air, rail, and automobile traffic control; emergency response systems, and, most of all, our rapidly growing dependence on health care delivery via high-performance computing and communications. When these systems fail, lives and fortunes may be lost.

At the same time, threats to dependable operations are growing in scope and severity. Leftover design faults (bugs and glitches) cause system crashes during peak demands, resulting in service disruptions and financial losses. Computer systems suffer stability problems due to unforeseen interactions of overlapping fault events and mismatched defense mechanisms.

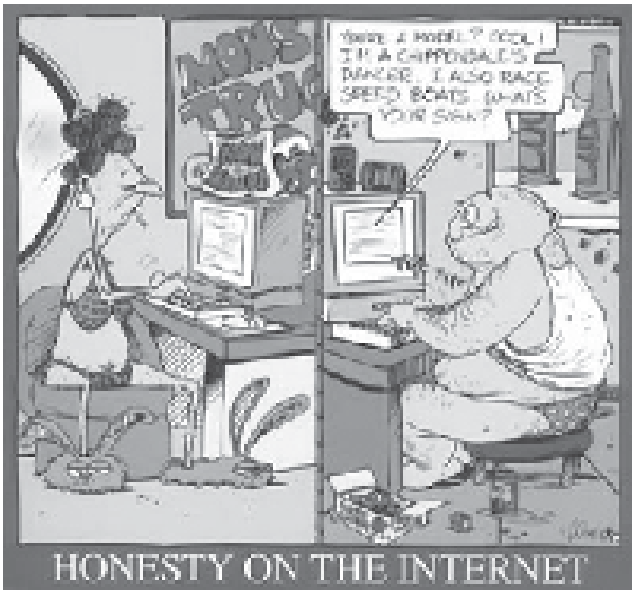
Hackers and criminally minded individuals invade systems, causing disruptions, misuse, and damage accidents that result in breaking several communications links,affecting entire regions. Finally,we face the possibility of systems damage by "info terrorists".

Fault tolerance is our best guarantee that high confidence systems will not betray the intentions of their builders and the trust of their users by succumbing to physical,design or human-machine interaction faults,or by allowing viruses and malicious acts to disrupt essential services.

As the computing sciences move rapidly toward "professionalization",the new topic must be incorporated into the curriculum— ethics,i.e. professional ethical behavior. Computer professionals are experts in their field with up-to-date knowledge that they can effectively and consequently apply in product development. They are also responsible to the product's users and must understand the effects of their decisions and actions on the public at large.

Professionals are responsible for designing and developing products,which avoid failures that might lead to losses,cause physical harm,or compromise national or company security. With so much info flowing across the Internet and because of the rising popularity of applets and similar modular applications,it is vital for the professionals to take responsibility in maintaining high standards for the products they develop.

Unit VII.
Virtual Reality



Prereading Discussion

1. What developments in computer technology have changed the way people live and work?
2. How have some home entertainments such as television, video recorders, and video games affected people's life?
3. How will further advances in computer technology continue to change the world?
4. It has been said that technology is a double-edged sword. What does that statement mean?
5. What is virtual reality?
6. Who can use virtual reality?
7. How can virtual reality benefit society?
8. How can virtual reality harm society?
9. Which uses of virtual reality appeal to you most?

Reading Analysis

VOCABULARY LIST

***Nouns**: sitcom, voyage, goggles, gear, content, combat, oblivion.*
***Verbs**: slip on (off), feature, strap, blast, bind, clutch, swoop.*
***Adjectives**: incredible, appropriate, ambitious, exciting, paraplegic.*
***Word combinations**: to take a ride, to go astray, the age of dinosaurs, to fight monsters, to don (strap on/into) cyberspace gear, a military point of view, a fiber optic glove, a computer-enhanced fantasy world.*

TEXT I. STRAP ON SOME EYEPHONES AND YOU ARE VIRTUALLY THERE

(1) One of the most exciting new areas of computer research is virtual reality. Having been featured in TV sitcoms as well as public television documentaries, virtual reality is merely an ambitious new style of computer interface. Virtual reality creates the illusion of being in an artificial world — one created by computers.

(2) Virtual reality visitors strap on a set of eyephones, 3-D goggles that are really individual computer screens for the eyes. Slipping on the rest of the gear allows you not only to see and hear, but also to sense your voyage. The world of virtual reality has been called cyberspace, a computer-enhanced fantasy world in which you move around and manipulate objects to your mind's content.

(3) When you move your head, magnetic sensors instruct the computer to refocus your eye phones to your new viewpoint. Sounds surround you, and a fiber-optic glove allows you to "manipulate" what you see. You may seek out strange new worlds, fight monsters in computer combat, or strap yourself into the seat of a Star Wars-type jet and scream through cyberspace, blasting all comers to oblivion (computer oblivion, at least). Or, with your stomach appropriately settled, you might even try out the most incredible roller coaster ride you will ever take in your life.

(4) For the disabled, virtual reality promises a new form of freedom. Consider the wheelchair bound paraplegic child who is suddenly able to use virtual reality gear to take part in games like baseball or basketball. Research funded by the government takes a military point of view, investigating the possibility of sending robots into the real conflict while human beings don cyberspace gear to guide them from back in the lab.

(5) Spectrum Holobyte, acomputer games development company, announced its first virtual reality computer game for the home during 1991 Christmas season. Imagine yourself suddenly clutching your handheld laser pistol as a giant bird swoops right at you from the age of dinosaurs! Your laser shot goes astray, and you feel yourself suddenly lifted off the ground and carried higher and higher. That's enough - for some of us it can be virtually too real.

EXERCISES

I. True or false?

1. Virtual reality is acomputer-built fantasy world.
2. Virtual reality is also called cyberspace.
3. There are no limits to virtual reality.
4. Virtual reality is created by being in aspecial room.
5. Virtual reality is available only on expensive computer systems.
6. Virtual reality is the leading edge of the computer technology.
7. Eyephones are the 3DFX fiber-optic glasses.
8. Eyephones are not the only virtual reality gear.
9. Virtual reality might be misused.
10. Virtual reality can return the disabled to the full-fledged life.
11. Virtual reality was designed by the military to guide robots.
12. One can not only see or hear virtual reality, but also feel and smell it.
13. Virtual reality is only atype of computer interface.

II. Read the words as theyare used in the following sentences and tryto come up with your own definition:

1. Using computers to create graphics and sounds, virtual reality makes the viewer believe he or she is in another world.
2. Three-dimensional images are created using technology that fools the viewers' mind into perceptive depth.

3. Plug a terminal directly into the brain via a prepared skull and you can enter cyberspace.
4. I've got a set of eyephones, 3D goggles, a fiber optic glove and the rest of the gear.
5. There are many word substitutes for invalids, e.g. the handicapped, challenged by birth or by accidents, disabled people.
6. The bowman took a deep breath, aimed at the target and shot, but the arrow went astray.

Virtual reality — _____
Three-dimensional (3D) — _____
Cyberspace — _____
Gear — _____
Disabled — _____
To go astray — _____

III. Put the proper words into sentences:

a) *fiber-optic, swoop, go astray, clutching, gear, to one's mind content, enhance, cyberspace, eye phones.*

1. Virtual reality is sometimes called...
2. 3-D ... are really individual computer screens for the eyes.
3. Virtual reality can ...possibilities of the disabled.
4. The manual ...box allows you to slow down without braking, while the automatic one doesn't.
5. Cyberspace allows everybody to change it...
6. The letters wrongly addressed...
7. ...unknown things may cause an accident.
8. By the end of the 20th century metal wires had been replaced by ... ones.
9. In one of the s the ...the NATO has lost their most expensive fighter.

b) *be, have, see, do, leave, write, tell.*

1. It was more than a hundred years ago that Lewis Carroll ... about Alice's trip through the looking glass.
2. Now that fiction ... became a reality ... or you might say, a virtual reality ... because that's the name of a new computer technology that many believe will revolutionize the way we live.
3. Trainees fighting in virtual battles often cannot ... a man from a machine.

4. Virtual reality lets you travel to places you've never ..., do things you've never — without ... the room.
5. Some day, you will ... that virtual reality makes other forms of entertainment, such as TV and movies, obsolete.

IV. Guess the meaning of the italicized words:

1. Virtual reality *straddles* the foggy boundary between fantasy and fact.
2. Imagine a place and you'll be able to step into it. *Conjure* up a dream and you'll be able to fly through it.
3. He's *launched* one of the first computers to mass-produce virtual reality systems.
4. Virtual reality techniques have been used to make a 3D model of the planet Mars. There are, of course, more *down-to-earth* applications. Virtual reality models of urban landscapes are allowing urban planners to redesign Main Street without leaving the room.
5. We're now reaching a point where the simulations are so realistic that the line between playing a game or a simulation and actually blowing people up is becoming *blurred*.

V. Construct other sentences in these patterns:

1. Virtual reality has been featured in TV sitcoms as well as public television documentaries.
2. Slipping on the rest of the gear allows you to sense your voyage.
3. For the disabled, virtual reality promises a new form of freedom.
4. Eyephones are not the only virtual reality gear.
5. You can not only see or hear in virtual reality, but also feel and smell
6. Virtual reality lets you travel to places you have never visited.
7. In the future, people will be able to have easy access to virtual reality systems.
8. If virtual reality technology were more affordable at present time, many more people would be able to try it.
9. Virtual reality makes other forms of entertainment such as TV and movies obsolete.

VI. Fill in the chart with the appropriate info:

Who uses virtual reality?

User	Use	Implementation	Benefit
NASA	recreating different worlds	flight simulation; battle simulation	risk-free, inexpensive military training
Urban planners			
Architects			early problem solving
Medicine		turning a CAT scan into 3D model of the patient's body	
Disabled			

VII. Translate into English:

1. Виртуальная реальность — это интерактивная, мультисенсорная среда, смоделированная компьютером.
2. Для человеческой расы виртуальная реальность станет поворотной вехой.
3. Виртуальная реальность принесет человечеству больше вреда, чем пользы.
4. Наилучшее применение виртуальная реальность найдет в военной и медицинской технике.
5. Виртуальная реальность дает шанс полноценного развития инвалидам.
6. Человек создал компьютер, компьютер создал виртуальную реальность.
7. С дальнейшим совершенствованием техники виртуальная реальность станет одним из наиболее популярных способов путешествия.
8. Искусство со временем станет ненужным, так как его заменит виртуальная реальность.
9. Когда-нибудь виртуальная реальность сделает другие формы развлечения, такие как телевидение и кино, устаревшими.

10. Термин *киберпространство* был придуман писателем-фантастом В. Гибсоном для описания безразмерного виртуального пространства электронной среды.

Topics for Essays, Oral or Written Reports

1. Virtual reality, areality?
2. Is it possible to create aperfect virtual reality?
3. Computers take you on mind trips. Where would you like to go on a mind trip?
4. Virtual reality as the way of exploring the world.
5. The perspectives of the virtual reality development.

Essay Selection for Reading as a Stimulus for Writing

IS IT POSSIBLE TO CREATE PERFECT VIRTUAL REALITY?

Human beings have always been seeking for a better place to live, better food to eat, better people to meet. The wise have concluded that there's no perfection itself. Human's brain identifies reality by its imperfection. And thus, the attempts to create ideal world turned to creating the world alike reality — virtual reality.

On the first stage, when technology wasn't so developed, virtual reality models just presented the essence of the current processes. But along with the development of technology and science a real world model is quite similar to our life. It's still something alike, a copy but not perfect. Copying itself isn't an example to follow, but this way we may explore the universe more carefully. So what are the problems of creating perfect virtual reality — cyberspace where you can't say whether it's cyberspace or not?

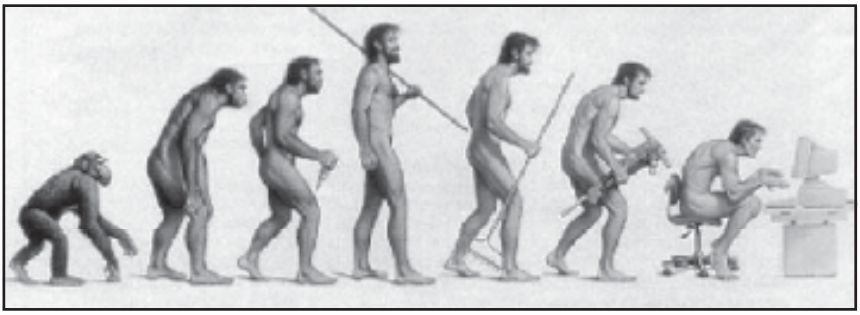
One of the difficulties is that it doesn't look like reality. We can't present the needed number of colors, the full palette our eye can catch. We can't introduce shades that really look like shades because the rendering

algorithms we have are huge and approximate. And it's still not possible to show such a movie in real time.

If we'd like just to imitate the movements of molecules, which are easy to be programmed, and this way to model the reality, again, we have a great wall to be stepped over. Our knowledge of micro world is poor and even though Einstein himself worked at the Uniform Field Theory, it is still uncompleted. On the other hand, the molecules are so many that programming a single cell, let alone even an insect, is the work of life for hundreds of programmers. Nobody can imagine the difficulty of virtualization of a human being. To model the universe we should create another one.

There are tasks to be solved before we can create 99% acceptable virtual reality: e.g. the speed of processing, fractal algorithms for rendering, quark mechanics and so on. But has anybody thought of connecting a computer to human's brain and clipping the images you and your ancestors have seen to present for someone else, or maybe using the calculating and data processing capabilities of the cortex? By the way, the process of seeing, hearing, smelling, and feeling the world is just a bunch of electric signals entering the brain. May be, the answer is here, and the distance is not the unaccomplished technical achievements, but ideas, strategic decisions, some crazy projects like the Head Of Professor Dowel. Will there be the final step to create perfect virtual reality? Let's see.

Unit VIII.
IT Revolution



Prereading Discussion

1. What do computers-biz futurists say?
2. You start with the computer and end with the media, don't you?
3. What is multimedia?
4. Are the humans manipulated by the media in the same way as by reading?
5. Will every cycle of processor power and every byte of memory be sucked by new, larger software programs (Gate's law)?
6. The amount of info is said to be doubling every six to seven years. Can we keep up?
7. How might other humans use computers to control you?
8. When and how do you spend your time on the Internet?

Reading analysis

VOCABULARY LIST

***Nouns**: census, anarchy, lingo, prerogative, humiliation, transgression, junk, moderation, cornerstone, vehicle, abdication, over-reliance.*

***Verbs**: to mature, to approach, to roam, to browse, to surf, to reveal, to obscure, to hinder, to enhance.*
***Adjectives**: crucial, instant, dismissive, entrepreneurial, voluminous, incredible.*
***Word combinations**: back and forth, file transfer protocol (ftp), to filter out, to make sense, stress relievers, invasion of privacy.*

TEXT I. SURFING THE NET

(1) What is more impressive than the pyramids, more beautiful than Michelangelo's *David* and more important to mankind than the wondrous inventions of the Industrial Revolution? To the converted, there can be only one answer: the Internet that undisciplined radical electronic communications network that is shaping our universe. Multimedia, the electronic publishing revolution, is entering every area of our lives — college, work and home. This new digital technology combines texts, video, sound and graphics to produce interactive language learning, football, music, movies, cookery and anything else you might be interested in.

(2) The industrial age has matured into the information age; wherein the means to access, manipulate, and use information has become crucial to success and power. The electronic superhighway provides an entry to libraries, research institutions, databases, art galleries, census bureaus, etc. For those of us interested in intercultural communications Cyberspace is a universal community, with instant access not only to information anywhere, but also to friends old and new around the globe.

(3) The Internet is an amorphous global network of thousands of linked computers that pass information back and forth. While the Internet has no government, no owners, no time, no place, no country, it definitely has a culture, which frequently approaches anarchy; and it has a language, which is more or less English. People who interact in an Internet environment know how addresses are formed, how to use e-mail, ftp, Usenet News, Telnet, and other software tools.

(4) Like all new worlds, Cyberspace has its own lingo, for example: *e-bahn, i-way, online, freenet, web page, freeware, browser, gopher, archie, gateway.* There are words to describe people who roam the net: *netters, e-surfers, internet surfers, netizens, spiders, geeks...* The

Internet has its own prerogatives: for example, the dismissive term *lurker* for the person who hangs around the net, reading what is there but not contributing anything. The term *flaming* refers to the public humiliation of another netter as punishment for a real or imagined transgression against net culture.

(5) Large-scale use of computer-to-computer transfer of information was implemented by the US military in the late 60s and early 70s — part of the superpower competition of the cold war and the arms race. The US military created an electronic network (Arpanet) to use computers for handling the transfer of large amounts of sensitive data over long distances at incredible speed. Computer-to-computer virtual connections, using satellites and fiber optics, have distinct advantages over telephone or radio communications in the event of a nuclear attack. Mathematicians and scientists (and their universities) have been linked and electronically exchanging information over the Internet since the mid-70s.

(6) Now the Internet has become commercialized with private and public companies offering access to it. (CompuServe — is the best-known international commercial electronic access provider). The Internet is being expanded and improved so that every home, every school, every institution can be linked to share data, information, music, video and other resources. If you have a computer or a computer terminal, some kind of connection (probably, modem and telephone line) to the Internet, and some kind of Internet service provider, you can participate in electronic communication and become a citizen of the global village.

(7) Information technology is a good vehicle for the argument. Some scientists remind us that voluminous information does not necessarily lead to sound thinking. There are many genuine dangers that computers bring to modern society: efficient invasion of privacy, overreliance on polling in politics, even abdication of control over military decision-making. *Data glut* obscures basic questions of justice and purpose and may even hinder rather than enhance our productivity. *Edutainment* software and computer games degrade the literacy of children. On the other hand, only a few use PCs on network to share information and ideas. In most cases IT is used to speed routine tasks, to automate manual processes rather than to change work patterns and business practices. Most managers use their PCs to edit documents — not a

good use of their time when they could be dreaming up creative applications. It is time to evaluate anew the role of science and technology in the affairs of the human species.

(8) So, if you are riding on the information highway, you should take steps to cope with information overload. The gift of boundless information is causing a new kind of stress known alternately as *technostress*, information overload or Information Fatigue Syndrome. Some experts say that we don't get anywhere near the data it takes to overload our neurons. According to some estimates, our mind is capable of processing and analyzing many gigabytes of data per second — a lot more data than any of today's supercomputers can process and act on in real time. We feel overloaded by the quantity of information because we are getting it unfiltered. We should filter out the junk and turn data into shapes that make sense to us. Stress in moderation is good: it drives us to achieve, stimulates our creativity and is the force behind social and technological breakthroughs. Stress is revealing how humans are in some ways more primitive than the technology they have created. Meditation, muscular relaxation, aerobics, jogging, yoga can be effective stress relievers, but no technique is universal: experiment and find the one that best works for you.

(9) The cornerstone of an economy are land, labor, capital and entrepreneurial spirit. That traditional definition is now being challenged. Today you find a fifth key economic element: *information* dominant. As we evolve from an industrial to an information society, our jobs are changing from physical to mental labor. Just as people moved physically from farms to factories in the Industrial age, so today people are shifting muscle power to brain power in a new, computer-based, globally linked by the Internet society.

EXERCISES

I. How much has technology changed in just the last 20 years?

II. If you were to bury a time capsule to be opened in 2100 what would you put into it?

III. Explain the buzzwords in the text.

IV. Define the following terms:

e.g. Buffer — an area of storage used to temporarily hold data being transferred from one device to another.

e-mail, byte, browser, zoom, bug, cursor, buffer, download, gateway, drive, router, hypertext, protocol, graphics, modem, freenet.

V. What do these abbreviations stand for:

DT, DP, VDU, 16K, AI, IT, CPU, RB, RZ, i/o.

VI. What do these acronyms stand for:

CAD, CAM, ROM, RAM, CDI, LAN, Y2K, ALGOL, BASIC, COBOL, FORTRAN.

VII. Translate some computer terms:

***Simple terms**: anchor, wizard, versioning, relink, cipher, containment.*

***Compounds**: clipboard, multithreaded, client-pull, design-time, run-time, polyline, turnkey, bitmapping, bandwidth.*

***Term collocations**: frame-based layout, active template library, active server pages, asynchronous moniker, active data objects, connectable object, frequently asked question, hypertext markup language, hypertext transfer protocol, integrated development environment, interface definition language, Internet service provider, object linking and embedding, remote procedure call, software development kit, uniform data transfer.*

VIII. Put the proper words into sentences:

multimedia, dominant, spider, netizen, flame, writing, foolproof, technostress, zoom.

1. Please, don't ...me if you disagree with this.
2. The person who develops a ... lock for computer data will make a fortune.
3. ....a person or computer program that searches the web for new links and link them to search engines.
4. ....spends an excessive amount of time on the Internet.
5. Windows and Unix operating systems are going to be on the desktops and on servers in ...numbers (B. Gates).
6. Hit a video button and ... for a closer look.

7. ... brings together different types of visual devices: texts, pictures, sounds, animations, speech.
8. Each person handles ... differently.
9. Good ... on the Net tends to be clear, vigorous, witty and above all brief: short paragraphs, bulleted lists, one-liners — the units of thought.

TEXT II. THE LANGUAGE OF E-MAIL

(1) E-mail is the simplest and most immediate function of the Internet for many people. Run through a list of questions that new e-mail users ask most and some snappy answers to them.

(2) **What is electronic mail?** Electronic mail, or e-mail as it's normally shortened to, is just a message that is composed, sent and read electronically (hence the name). With regular mail you write out your message (letter, postcard, whatever) and drop it off at the post office. The postal service then delivers the message and the recipient reads it. E-mail operates basically the same-way except that everything happens electronically. You compose your message using e-mail software, send it over the lines that connect the Internet's networks and the recipient uses an e-mail program to read the message.

(3) **How does e-mail know how to get where it's going?** Everybody who's connected to the Internet is assigned a unique e-mail address. In a way, this address is a lot like the address of your house or apartment because it tells everyone else your exact location on the Net. So anyone who wants to send you an e-mail message just tells the e-mail program the appropriate address and runs the Send command. The Internet takes over from there and makes sure the missive arrives safely.

(4) **What's this netiquette stuff I keep hearing about?** The Net is a huge, unwieldy mass with no "powers-that-be" that can dictate content or standards. This is, for the most part, a good thing because it means there's no censorship and no one can wield authority arbitrarily. To prevent this organized chaos from descending into mere anarchy, however, a set of guidelines has been put together over the years. These guidelines are known collectively as netiquette (network etiquette) and they offer suggestions on the correct way to interact

with the Internet's denizens. To give you a taste of netiquette, here are some highlights to consider.

- Keep your message brief and to the point and make sure you clear up any spelling slips or grammatical gaffes before shipping it out.
- Make sure the Subject lines of your message are detailed enough so they explain what your message is all about.
- Don't SHOUT by writing your missives entirely in upper-case letters.
- Don't bother other people by sending them test messages. If you must test a program, send a message to yourself.

(5) **What's a flame?** The vast majority of e-mail correspondence is civil and courteous, but with millions of participants all over the world, it's inevitable that some folks will rub each other the wrong way. When this happens, the combatants may exchange emotionally charged, caustic, often obscene messages called flames. When enough of these messages exchange hands, an out-and-out flame war develops. These usually burn themselves out after a while, and then the participants can get back to more interesting things.

(6) **Is e-mail secure?** In a word, no. The Net's open architecture allows programmers to write interesting and useful new Internet services, but it also allows unscrupulous snoops to lurk where they don't belong. In particular, the e-mail system has two problems: it's not that hard for someone else to read your e-mail, and it's fairly easy to forge an e-mail address. If security is a must for you, then you'll want to create an industrial strength password for your home directory, use encryption for your most sensitive messages, and use an anonymous remailer when you want to send something incognito.

EXERCISES

I. Answer the questions:

1. What major problems are there with the e-mail? Are they opinions or facts? Would it be a problem for you?
2. What do you think is the reason for the various bits of netiquette which are mentioned?

3. Find at least 5 examples of a very colloquial and chatty style used in the text. Why are they used?
4. For which of the following types of writing is it necessary to be brief?

Instructions, love letters, news reports, business proposals, faxes, adverts, insurance claims, curriculum vitae, short stories, scientific reports, e-mail, poems.

5. Write a summary of the text. Include only the information, ignore any extra remarks. Write in a neutral rather than an informal style.

II. E-mailers also keep their message brief by abbreviating frequently used phrases. Complete these common phrases:

AAMOF	as am...of f...
AFAIK	as f...as I k...
FYI	for your i...
FYA	f... y... am...
IMO	in my o...
IOW	in o... words
NRN	not r... necessary
TTYL	talk to y... l...
FAQ	f...a... question(s)
BTW	by t...w...
LOL	la... o... loud
KHYF	k... ho... y... fe...
IMHO	in my h... o...
WYSIWYG	what y... see is w... y... g...
RTFM	read the f... m...

III. E-mail messages usually have the following format:

To: (Name and e-mail address of recipient)
From: (Name and e-mail address of sender)
Subject: (Identification of main point of message)
Here is an example of an e-mail address:
smith@cup.ac.uk

Note that the symbol @ in e-mail address is read *at* and that the full stops are read as dot. Thus the example address would be read as *Smith at C – U – P dot A – C dot U – K.*

The ac.uk in the example address tells you that the address is based at a university in the United Kingdom.

Do you know anyone with an e-mail address? If so, dictate it to other students in the class. If not, then your teacher will give you some addresses for dictation.

IV. E-mailers make use of symbols called smileys (or emoticons) which can be written using standard letters and signs.

:-) Your basic smiley. This is used to mean *I'm happy.*
;-) Winking smiley. *I'm flirting or being ironic.*
;-(Frowning smiley. *I did not like something.*
:-| *I'm indifferent.*
8-) *I wear glasses.*
:-{) *I have a moustache.*
:-~) *I have a cold.*
C=:^) Head cook, chef-de-cuisine.
Q:^) Soldier, man with beret, boy scout.
*:O) Clown face; *I'm feeling like a buffoon.*
:^9 Licking the lips; *very tasty or delicious.*
/\/\/\/\/\O:>~ Snake (or to rake someone over the coals)

V. Match these smileys to their meanings listed below:

%-) (-: |-| :-Q :-@ :-D <:-| (:) [:-)

1. I'm a dunce.
2. I'm an egghead.
3. I'm asleep.
4. I'm laughing.
5. I'm left-handed.
6. I'm screaming.
7. I'm wearing a Walkman.
8. I'm sticking my tongue out at you.
9. I've been staring at this screen for too long.

VI. Discuss:

1. Do faxes, electronic mail and papers offer an escape from human interaction?
2. Could all these topography symbols such as e-smiles supplant the more emotive ingredients of two-way communication?

3. How can we balance the use of technology and real-life conversation?

VII. Write an e-mail message to your friend (on paper). Use an appropriate format and a chatty style. Try to use at least one smiley and some abbreviations.

VIII. Translate into English:

I. СЛОВАРИК ЮНОГО ИНТЕРНЕТчИКА. ТОчКА, ТОчКА, ЗАПТА — ВОТ И РОЖИЦА КРИВА

История появления в Интернете забавных рожиц, составленных из точечек, скобочек и запятых, вполне объяснима. Всем хороши электронные письма — и составлять их легко, и доходят до адресата они быстро, вот только хранят они лишь сухие компьютерные буквы, даже почерк, по которому можно было бы судить об эмоциях пишущего человека, исчезает. А жаль. Вот и придумали хитроумные компьютерные фанаты целый язык, использующий человеческую мимику. Рожицы, или, как их еще называют, *смайлики* (от английского *улыбающийся*), конструируют из знаков препинания. Только разглядывать их надо под углом 90 градусов.

Итак:

:(— хмурый
:-| — серьезный
:-) — улыбающийся
:-))) — радостный
;-) — подмигивающий
;(— плачущий
;.(.. — рыдающий
:^) — счастливый
:| — суровый
:^(— печальный
:@) — счастливый, как поросенок
|-(— усталый и недовольный
8) — большие глаза
|-0 — сонный (зевающий)
8O — вопящий
|-| — спящий

:-0 — ошарашенный
|-P — облизывающий
:-D или 8-D — смеющийся
8-(— запуганный
:-P — дразнилка (с высунутым языком)
8-) — удивленный (с широко открытыми глазами)
:-(— расстроенный
8-|— сосредоточенный
:'-(— ревущий
8-‖— рассерженный
:-/ — насупленный
9-0 — испуганный
:-[ ] — ошеломленный
:-> — саркастичный
:-[— вампир
:-E — клыкастый вампир
:-7 — кривая улыбка
:-* — угрюмый
:-@ — орущий
:-Q — курящий
:-? — курящий трубку
:-S — непоследовательный, бессвязный
:-D — громко хохочущий
:-X — рот на замке
:-C — лодырь
:-' — сплевывающий (табак)
:-9 — облизывающий губы
:-$ — рот скреплен проволокой
:-% — банкир
:-} — бородатый
:-{ — усатый
:*) — пьяный
:=) — с похмелья
%-) — программист
8-) — в солнечных очках
.-) — одноглазый
g-) — в пенсне
{:-) — в парике
-:-) — панк
*<:-) — Санта-Клаус.

II. WWW

Все началось с того, что в 1948 году вышли книги К. Шеннона «Математическая теория связи» и Н. Винера «Кибернетика, или управление и связь в животном и машине». Они и определили новый вектор развития науки, в результате чего появился компьютер: вначале ламповый гигант, затем транзисторный и на интегральных схемах, на микропроцессорах. И вот в 1981 году появился персональный компьютер (IBM). В том же году вышла программа MS-DOS, а в 1990 — Windows-3.0, а далее пошло стремительное совершенствование «железа» и программного обеспечения. К концу столетия человечество получило потрясающую миниатюризацию компьютерной техники, сокращение «расстояния» между компьютером и человеком, тотальное проникновение компьютерных технологий в бытовую сферу. 1986 год — рождение Интернета, глобальной сети, охватившей практически все страны мира, поставляющей каждому пользователю текущую информацию, открывающей доступ к книгам большинства крупных библиотек мира, позволяющей каждому жителю планеты поговорить с любым другим землянином. Кроме того, Интернет обеспечивает единую финансовую систему, покупки, бытовые услуги, службу знакомств...

Несколько слов об Интернете в России. В 1990 году к сети были подключены около тридцати организаций, главным образом научных центров. Но только через пять лет состоялось официальное распространение WWW-технологий. В 1998 году количество пользователей Интернета достигло одного миллиона, а к 2000 году — 5,4 млн человек (По прогнозам, к концу 2001 года их станет 7,8 млн) Четверть регулярных «посетителей» Интернета живут в Москве и Санкт-Петербурге, другая четверть — в Сибири и на Дальнем Востоке, при этом больше половины посетителей Интернета проживают в городах численностью менее миллиона человек.

Компьютеризация и Интернет — столбовая дорога западной цивилизации в XXI веке. Хотим мы или нет — Россия много столетий тяготеет к европейскому пути развития. Поэтому и наше будущее связано не с сырьем, не с вооружением, а исключительно с широчайшей компьютеризацией школ и вузов, с выходом в мировую сеть Интернет, с поголовной компьютерной грамотностью молодежи. Другого пути нет, если мы не хотим остаться сырьевым придатком западного мира.

III. БИОКОМПЬЮТЕРЫ

Применение в вычислительной технике биологических материалов позволит со временем уменьшить компьютеры до размеров живой клетки. Пока это чашка Петри, наполненная спиралями ДНК, или нейроны, взятые у пиявки и подсоединенные к электрическим проводам.По существу, наши собственные клетки — это не что иное, как биомашины молекулярного размера, а примером биокомпьютера, конечно, служит наш мозг.

Ихуд Шапиро из Вейцмановского института естественных наук соорудил пластмассовую модель биологического компьютера высотой 30 см. Если бы это устройство состояло из настоящих биологических молекул, его размер был бы равен размеру одного из компонентов клетки — 0,000 025 мм.

Билл Дитто из Технологического института штата Джорджия провел интересный эксперимент, подсоединив микродатчики к нескольким нейронам пиявки.Он обнаружил, что в зависимости от входного сигнала нейроны образуют новые взаимосвязи.Вероятно, биологические компьютеры, состоящие из нейроподобных элементов, в отличие от кремниевых устройств, смогут искать нужные решения посредством самопрограммирования. Дитто намерен использовать результаты своей работы для создания мозга роботов.

IV. ОПТИчЕСКИЕ КОМПЬЮТЕРЫ

По сравнению с тем, что обещают молекулярные или биологические компьютеры, оптические ПК могут показаться не очень впечатляющими. Однако ввиду того, что оптоволокно стало предпочтительным материалом для широкополосной связи, всем традиционным кремниевым устройствам, чтобы передать информацию на расстояние нескольких миль, приходится каждый раз преобразовывать электрические сигналы в световые и обратно.

Целиком оптические компьютеры появятся через десятилетия, но работа в этом направлении идет сразу на нескольких фронтах. Например, ученые из университета Торонто создали молекулы жидких кристаллов, управляющие светом в фотонном кристалле на базе кремния.Они считают возможным создание оптических ключей и проводников, способных выполнять все функции электронных компьютеров.

Однако прежде чем оптические компьютеры станут массовым продуктом, на оптические компоненты, вероятно, перейдет вся система связи — вплоть до «последней мили» на участке до дома или офиса. Вближайшие 15 лет оптические коммутаторы, повторители, усилители и кабели заменят электрические компоненты.

Topics for Essays, Oral or Written Reports

1. The most interesting places you have explored on the Internet.
2. Next generation Internet.
3. My media.
4. The place of computer technology in our culture.

Unit IX.
Humor the Computer

Computer was given to man to complete him for what he is not; science jokes to console him for what he is. So keep smiling!

Reading and Discussion

A. Is there humor in the workplace? Perhaps, engineering is too serious to be funny — or is it not? Do you know any science jokes? Read one below and get ready to tell your favorite jokes.

An assemblage of the most gifted minds in the world were all posed the following question:

"What is 2 x 2?"

The engineer whips out his slide rule (so it's old) and shuffles it back and forth, and finally announces 3.99.

The physicist consults his technical references, sets up the problem on his computer, and announces, "It lies between 3.98 and 4.02".

The mathematician cogitates for a while, oblivious to the rest of the world, then announces, "I don't know what the answer is, but I can tell you, an answer exists!"

Philosopher, "But what do you mean by 2 x 2?" Logician: "Please define 2 x 2 more precisely."

Accountant closes all the doors and windows, looks around carefully, then asks, "What do you want the answer to be?"

Elementary school teacher from Columbus, Georgia, USA: 4

B. Electrical engineering vs. Computer science

Once upon a time, in a kingdom not far from here, a king summoned two of his advisors for a test. He showed them both a shiny metal box with two slots in the top, a control knob, and a lever. "What do you think this is?"

One advisor, an engineer, answered first. "It is a toaster, " he said. The king asked, "How would you design an embedded computer for it?" The engineer replied, "Using a four-bit microcontroller, I would write a simple program that reads the darkness knob and quantizes its position to one of 16 shades of darkness, from snow white to coal black. The program would use that darkness level as the index to a 16-element table of initial timer values. Then it would turn on the heating elements and start the timer with the initial value selected from the table. At the end of the time delay, it would turn off the heat and pop up the toast. Come back next week, and I'll show you a working prototype."

The second advisor, a computer scientist, immediately recognized the danger of such shortsighted thinking. He said, "Toasters don't just turn bread into toast, they are also used to warm frozen waffles. What you see before you is really a breakfast food cooker. As the subjects of your kingdom become more sophisticated, they will demand more capabilities. They will need a breakfast food cooker that can also cook sausage, fry bacon, and make scrambled eggs. A toaster that only makes toast will soon be obsolete. If we don't look to the future, we will have to completely redesign the toaster in just a few years.

With this in mind, we can formulate a more intelligent solution to the problem. First, create a class of breakfast foods. Specialize this class into subclasses: grains, pork, and poultry. The specialization process should be repeated with grains divided into toast, muffins, pancakes, and waffles; pork divided into sausage, links, and bacon; and poultry divided into scrambled eggs, hard-boiled eggs, poached eggs, fried eggs, and various omelet classes.

The ham and cheese omelet class is worth special attention because it must inherit characteristics from the pork, dairy, and poultry classes. Thus, we see that the problem cannot be properly solved without multiple

inheritance. At run time, the program must create, the proper object and send a message to the object that says, "Cook yourself." The semantics of this message depend, of course, on the kind of object, so they have a different meaning to a piece of toast than to scrambled eggs.

Reviewing the process so far, we see that the analysis phase has revealed that the primary requirement is to cook any kind of breakfast food. In the design phase, we have discovered some derived requirements. Specifically, we need an object-oriented language with multiple inheritance. Of course, users don't want the eggs to get cold while the bacon is frying, so concurrent processing is required, too.

We must not forget the user interface. The lever that lowers the food lacks versatility, and the darkness knob is confusing. Users won't buy the product unless it has a user-friendly, graphical interface. When the breakfast cooker is plugged in, users should see a cowboy boot on the screen. Users click on it, and the message "Booting UNIX v.8.3" appears on the screen. (UNIX 8.3 should be out by the time the product gets to the market). Users can pull down a menu and click on the foods they want to cook.

Having made the wise decision of specifying the software first in the design phase, all that remains is to pick an adequate hardware platform for the implementation phase. An Intel 80386 with 8 MB of memory, a 30 MB hard disk, and a VGA monitor should be sufficient. If you select a multitasking, object oriented language that supports multiple inheritance and has a built-in GUI, writing the program will be a snap. (Imagine the difficulty we would have had if we had foolishly allowed a hardware-first design strategy to lock us into a four-bit microcontroller!).

The king wisely had the computer scientist beheaded, and they all lived happily ever after.

EXERCISES

I. Find the equivalents to:

призвать; советник; снежно-белый; угольно-черный; встроенный; близорукий; множественное наследование; главное требование; параллельная обработка; загрузка; ниспадающее меню; в стадии разработки; многозадачный режим; стадия внедрения; легкое дело; обезглавить.

II. What do these acronyms and abbreviations stand for:

GUI, MB, vs., VGA, UNIX, v.8.3.

III. Translate the text.

IV. Compare other types of engineering with computer engineering.

C. Natural upgrade path

Come on people: you are all missing the most obvious upgrade path to the most powerful and satisfying computer of all. The upgrade path goes:

- Pocket calculator
- Commodore Pet / Apple II / TRS 80 / Commodore 64 / Timex Sinclair (Choose any of the above)
- IBM PC
- Apple Macintosh
- Fastest workstation of the time (HP, DEC, IBM, SGI: your choice)
- Minicomputer (HP, DEC, IBM, SGI: your choice)
- Mainframe (IBM, Cray, DEC: your choice)

And then you reach the pinnacle of modern computing facilities:

Graduate students. Yes, you just sit back and do all of your computing through lowly graduate students. Imagine the advantages.

Multi-processing, with as many processes as you have students. You can easily add more power by promising more desperate undergrads that they can indeed escape college through your guidance. Special student units can even handle several tasks on their own!

Full voice recognition interface. Never touch a keyboard or mouse again. Just mumble commands and they will be understood (or else!).

No hardware upgrades and no installation required. Every student comes complete with all hardware necessary. Never again fry a chip or $10,000 board by improper installation!

Just sit that sniveling student at a desk, give it writing utensils (making sure to point out which is the dangerous end) and off it goes.

Low maintenance. Remember when that hard disk crashed in your Beta 9900, causing all of our work to go the great bit bucket in the sky? This won't happen with grad. students. All that is required is that you

give them agood whack on the head when they are acting up, and they will run good as new.

Abuse module. Imagine yelling expletives at your computer. Doesn't work too well, because your machine just sits there and ignores you. Through the grad.student abuse module you can put the fear of god in them, and get results to boot!

Built-in lifetime. Remember that awful feeling two years after you bought your GigaPlutz mainframe when the new faculty member on the block sneered at you because his FeelyWup workstation could compute rings around your dinosaur? This doesn't happen with grad. students. When they start wearing out and losing productivity, simply give them the Ph.D.and boot them out onto the street to fend for themselves.Out of sight, out of mind!

Cheap fuel: students run on Coca-Cola(or the high-octane equivalent — Jolt Cola) and typically consume hot spicy Chinese dishes, cheap taco substitutes, or completely synthetic macaroni replacements. It is entirely unnecessary to plug the student into the wall socket (although this does get them going alittle faster from time to time).

Expansion options. If your grad.students don't seem to be performing too well, consider adding a handy system manager or software engineer upgrade. These guys are guaranteed to require even less than astudent, and typically establish permanent residence in the computer room. You'll never know they are around! Note however that the engineering department still hasn't worked out some of the idiosyncratic bugs in these expansion options, such as incessant muttering at nobody in particular, occasionally screaming at your grad.students, and posting ridiculous messages on worldwide bulletin boards.

So, forget your Babbage Engines, abacuses (abaci?), PortaBooks, DEK 666-3D's, and all that other silicon garbage.The wave of the future is in wetware, so invest in graduate students today! You'll never go back!

EXERCISES

I. Give synonyms to:

to upgrade, come on, choice, pinnacle, escape, built-in, to require, to yell, expletives, to abuse, to boot, to wear out, substitute, to work out, idiosyncratic, garbage, guidance.

II. Give antonyms to:

desperate, undergrads, powerful, proper, to consume, necessary, permanent, in particular, occasionally, natural, on one's own.

III. Answer the questions:

1. What are computing facilities?
2. What are the advantages of computing through undergraduate students?
3. What is "wetware"?
4. What can be called "silicon garbage"?
5. What paths would you choose to upgrade your computer?

D. Mother should have warned you!

If you can count on one person in this life, it's your mother. Particularly, you can rely on any mom anywhere to find the perils inherent in any situation. Indeed, no self-respecting mom ever missed an opportunity to caution her children about the dangers of everything from comic books to pool halls, to public restrooms.

Still, unless your mom was areal visionary, she probably didn't get much chance to warn you about PCs. Back when she was in peak nagging form, she probably hadn't even heard of the cursed things.

You may think that's just as well. We don't agree. The PC jungle is too scary to explore without knowing the answer to that comforting question, "What would mom say about this?"

So, after months of exhaustive polling of computer savvy moms around the country (there are more than you think), we've assembled the following list of ten PC perils your mom should have warned you about, if she'd only known. Take them seriously. Mom knows what she is talking about.

1. **Playing too much Tetris will make you go blind.** Go outside, get some fresh air. Do you want to look like aghost all your life?
2. **Never dial into strange bulletin board systems.** Who knows what kind of riff-raff you'll find there? Just last week, 1 saw ashow about the kind of trash that hangs out on these systems. "Modem bums," they're called.
3. **If they're so interested in information, why don't they go to the library?**

4. **Don't talk on the phone and debut spreadsheet macros at the same time.** It's very rude, and frankly, I don't like your language when the macro doesn't work the way you think it should.
5. **Clean up your hard disk.** God forbid you should be in an accident and someone should see how sloppy your directories are.
6. **You don't have to rush out and buy every trendy new product.** So what if all your friends are buying it and the word is it'll be the next standard? You wouldn't jump off a bridge just because everyone else did, would you?
7. **Be sure to write your name and phone number on all your floppy disk sleeves.** That way, if they ever get mixed up with someone else's, you can tell which ones are yours.
8. **Never put a disk into your drive if you don't know where it's been.** Your computer might catch a disease or something. Don't laugh, it's not funny. That's what happened to the Kelly boy, and his PC hasn't been the same since.
9. **Sit up straight, and for heaven's sake, not so close to that monitor screen.** What do you want to do, go blind and look like a pretzel?
10. **Always keep your icons and windows neatly arranged.** A cluttered desktop metaphor is the sign of a cluttered mind.
11. **Always eat your vegetables.** Okay, so it doesn't have anything to do with computers, it's good advice anyway. And who said mothers had to be consistent?

EXERCISES

I. Find the equivalents to:

упустить возможность; присущий; фантазер; получить шанс; утомительный; "кумекающие" в компьютерах (жарг.); ослепнуть; мусор; электронная доска объявлений; очистить; наклейка на дискете; хороший совет; в любом случае; последовательный.

II. Give synonyms to:

to caution, danger, public restrooms, to nag, peak, to curse, riff-raff, bums, debut, sloppy, trendy, cluttered, consistent.

III. Answer the questions:

1. What do all mums usually warn their children about?

2. What were you warned about when a child?
3. What advice did you take seriously?
4. What are the Top Ten PC Perils in your opinion?
5. What of them would you warn your children about?

BILL GATES IN HEAVEN

Bill Gates died and, much to everyone's surprise, went to Heaven. When he got there, he had to wait in the reception area.

Heaven's reception area was the size of Massachusetts. There were literally millions of people milling about, living in tents with nothing to do all day. Food and water were being distributed from the backs of trucks, while staffers with clipboards slowly worked their way through the crowd. Booze and drugs were being passed around. Fights were commonplace. Sanitation conditions were appalling. All in all, the scene looked like Woodstock gone metastatic.

Bill lived in a tent for three weeks until finally, one of the staffers approached him. The staffer was a young man in his late teens, face scarred with acne. He was wearing a blue T-shirt with the words TEAM PETER emblazoned on it in large yellow lettering.

"Hello," said the staffer in a bored voice that could have been the voice of any clerk in any overgrown bureaucracy. "My name is Gabriel and I'll be your induction coordinator.'' Bill started to ask a question, but Gabriel interrupted him. "No, I'm not the Archangel Gabriel. I'm just a guy from Philadelphia named Gabriel who died in a car wreck at the age of 17. Now give me your name, last name first, unless you were Chinese in which case its first name first"

"Gates, Bill." Gabriel started searching through the sheaf of papers on his clipboard, looking for Bill's Record of Earthly Works. "What's going on here?" asked Bill. "Why are all these people here? Where's Saint Peter? Where are the Pearly Gates?"

Gabriel ignored the questions until he located Bill's records. Then Gabriel looked up in surprise, "It says here that you were the president of a large software company. Is that right?"

"Yes."

"Well then, do the math chip-head! When this Saint Peter business started, it was an easy gig. Only a hundred or so people died every day, and Peter could handle it all by himself, no problem. But now there are over five billion people on earth. Come on, when God said to 'go forth

and multiply,' he didn't say 'like rabbits'. With that large a population, ten thousand people die every hour. Over a quarter-million people a day. Do you think Peter can meet them all personally?"

"I guess not".

"You guess right. So Peter had to franchise the operation. Now, Peter is the CEO of Team Peter Enterprises, Inc. He just sits in the corporate headquarters and sets policy. Franchisees like me handle the actual inductions." Gabriel looked through his paperwork some more, and then continued, "Your paperwork seems to be in order. And with a background like yours, you'll be getting a plum job assignment"

"Job assignment?"

"Of course. Did you expect to spend the rest of eternity sitting and drinking ambrosia? Heaven is a big operation. You have to put your weight around here!" Gabriel took out a triplicate form, had Bill sign at the bottom, and then tore out the middle copy and handed it to Bill. "Take this down to induction center #23 and meet up with your occupational orientator. His name is Abraham." Bill started to ask a question, but Gabriel interrupted him, "No, he's not that Abraham."

.....

Bill walked down a muddy trail for ten miles until he came to induction center #23. He met with Abraham after a mere six-hour wait.

"Heaven is centuries behind in building its data processing infrastructure," explained Abraham. "As you've seen, we're still doing everything on paper. It takes us a week just to process new entries."

"I had to wait three weeks?" said Bill. Abraham stared at Bill angrily, and Bill realized that he'd made a mistake. Even in Heaven, it's best not to contradict a bureaucrat." Well, Bill offered, "maybe that Bosniathing has you, guys, backed up."

Abraham's look of anger faded to mere annoyance. "Your job will be to supervise Heaven's new data processing center. We're building the largest computing facility in creation. Half a million computers connected by a multi-segment fiber optic network, all running into a back-end server network with a thousand CPUs on a gigabit channel. Fully fault tolerant. Fully distributed processing. The works."

Bill could barely contain his excitement "Wow! What a great job! This is really Heaven! "

"We're just finishing construction, and we'll be starting operations soon. Would you like to go to the center now?"

"You bet!"

Abraham and Bill caught the shuttle bus and went to Heaven's new data processing center. It was a truly huge facility, a hundred times bigger than the Astrodome. Workmen were crawling all over the place, getting the miles of fiber optic cables properly installed. But the center was dominated by the computers. Half a million computers, arranged neatly row-by-row, half a million....

....Power PC's....

....all running Mac/OS? Not an Intel PC in sight! Not a single byte of Microsoft code!

The thought of spending the rest of eternity using products that he had spent his whole life working to destroy was too much for Bill. - "What about PCs???" he exclaimed. "What about Windows??? What about Excel??? What about Word???"

"You're forgetting something", said Abraham.

"What's that?" asked Bill plaintively.

"This is Heaven," explained Abraham. "We need an operating system that's heavenly to use. If you want to build a data processing center based on PCs running Windows, then ....

....GO TO HELL!

E. Can you do a better translation?

a) 0A programmers

0A young programmers began to work online,
One didn't pay for Internet, and then there were 9.

9 young programmers used copies that they made,
But one was caught by FBI, and then there were 8.

8 young programmers discussed about heaven,
One said, "It's Windows 95!", and then there were 7,

7 young programmers found bugs they want to fix,
But one was fixed by the bug, and then there were 6.

6 young programmers were testing the hard drive,
One got the string "Format complete", and then there were 5,

5 young programmers were running the FrontDoor,
The BBS of one was hacked, and then there were 4.

4 young programmers worked using only C,
One said some good about Pascal, and then there were 3.

3 young programmers didn't know what to do,
One tried to call the on-line help, and then there were 2,

2 young programmers were testing what they done,
One got avirus in his brain, and then there was 1.

1 young programmer was as mighty as ahero,
But tried to speak with user, and then there was 0.

Boss cried: "Oh, where is the program we must have?!"
And fired one programmer, and then there were FF.

0A программистов

0A программистов продукт решили сделать.
1 спросил: «А деньги где?» и их осталось девять.

9 программистов предстали перед боссом
1 из них не знал foxpro и их осталось восемь.

8 программистов купили IBM.
1 из них сказал «Mac — класс!» и их осталось семь.

7 программистов решили help прочесть.
У одного накрылся винт и их осталось шесть.

6 программистов пытались код понять.
1 из них сошёл с ума и их осталось пять.

5 программистов купили CD-ROM.
1 принёс китайский диск — остались вчетвером.

4 программиста работали на «C».
1 из них хвалил PASCAL и их осталось три.

3 программиста играли в сетке в «DOOM».
1 чуть-чуть замешкался и счёт стал равен двум.

2 программиста набрали дружно «WIN».
1 устал загрузки ждать — остался лишь один.

1 программист всё взял под свой контроль,
Но встретился с заказчиком и их осталось ноль.

0 программистов ругал сердитый шеф,
потом уволил одного и стало их FF!!!

b) What if Dr. Suess wrote a manual?

If a packet hits a pocket on a socket on a port,
And the bus is interrupted as a very last resort,
And the address of the memory makes your floppy disk abort,
Then the socket packet pocket has an error to report.

If your cursor finds a menu item followed by a dash,
And the double-clicking icon puts your window in the trash,
And your data is corrupted 'cause the index doesn't hash,
Then your situation's hopeless and your system's gonna crash!

If the label on the cable on the table at your house,
Says the network is connected to the button on your mouse,
But your packets want to tunnel on another protocol,
That's repeatedly rejected by the printer down the hall,

And your screen is all distorted by the side effect of Gauss,
So your icons in the window are as wavy as a souse,
Then you may as well reboot and go out with a bang,
'Cause as sure as I'm a poet, the sucker's gonna hang!

When the copy of your floppy's getting sloppy on the disk,
And the microcode instructions cause unnecessary risk,
Then you have to flash your memory and you'll want to RAM
your ROM.
Quickly turn off the computer and be sure to tell your mom.

А если бы доктор Суэз написал инструкцию?

Если вдруг пакет программный вас решится обобрать,
И от прерываний шина станет вдруг озорничать,
Если память с дисководом станут люто воевать,
Вам ни денег, ни железа, ни покоя не видать.

Если вдруг в меню стандартном ваш курсор начнет шалить,
И двойной щелчок иконку сразу может удалить,
И мозги у базы данных перестанут вдруг варить,
Это значит, все пропало, безвозвратно, может быть.

Если надпись на коробке может дельный дать совет,
И мышиный коврик даже подключиться в Internet,
А несносные программы вам откажут делово,
Видите ли, протокол им не подходит. Каково?

Если вид у монитора как в разбитые очки,
И по плоскости экрана расплываются значки,
Выключайте свой компьютер и идите погулять.
Я уверен, он не станет ладить с вами. Его ...!

Если от резервных копий прохудится гибкий диск,
И ассемблерные вставки повышают резко риск,
Лучше вы сотрите память, отпаяйте ПЗУ —
Бесполезное железо вам, конечно, ни к чему.

F. Render into English

a)

1. Если вам удалось написать программу, в которой транслятор не обнаружил ошибок, обратитесь к системному программисту — он исправит ошибки в трансляторе.
2. Создадим реальную виртуальность!
3. В природе программирования лежит то, что нет соотношения между «размерами» самой ошибки и проблемами, которые она создает.
4. Когда программист испытывает затруднения при поиске ошибки, это значит, что он ищет не там, где следует.
5. Мозг человека обычно загружен лишь на 10 % своей мощности: остальное — резерв для операционной системы.
6. Вычислительная машина обладает притягательной силой биллиарда или музыкального автомата, доведенного до логической завершенности.
7. Программист, как поэт, работает почти исключительно головой.
8. Закон Брукса: если программистский проект не укладывается в сроки, то добавление рабочей силы только задержит его окончание.
9. Пользователь не знает, чего он хочет, пока не увидит то, что он получил.
10. Я слышу и забываю. Я вижу и запоминаю. Я делаю и понимаю.
11. На пустом диске можно искать вечно.
12. Я пишу все свои критические программы на ассемблере, а комедийные — на фортране.
13. Бесполезно придумывать защиту от дурака — ведь дураки так гениальны.
14. Если отладка — процесс удаления ошибок, то программирование должно быть процессом их внесения.
15. Что для одного — ошибка, для другого — компьютерные данные.

b)

1. Законы машинного программирования.
   a) Любая действующая программа устарела.
   b) Любая программа обходится дороже и требует больших затрат времени, чем предполагалось.
   c) Если программа полностью отлажена, ее нужно будет скорректировать.
   d) Любая программа стремится занять всю доступную память.
   e) Ценность программы прямо пропорциональна весу ее «выдачи».
   f) Сложность программы растет до тех пор, пока не превысит способности программиста.
2. Постулаты Трумэна по программированию.
   a) Самая грубая ошибка будет выявлена, лишь когда программа пробудет в производстве по крайней мере полгода.
   b) Контрольные перфокарты, которые решительно не могут стоять в неправильном порядке, будут перепутаны.
   c) Если назначен специальный человек для контроля за чистотой исходной информации, то найдется изобретательный идиот, который придумает способ, чтобы неправильная информация прошла через этот контроль.
   d) Непечатный жаргон — это тот язык, которым решительно все программисты владеют в совершенстве.
3. Закон Нейсера. Можно сделать защиту от дурака, но только не от изобретательного.
4. Законы ненадежности Джилба.
   a) Компьютеры ненадежны, но люди еще ненадежнее.
   b) Любая система, зависящая от человеческой надежности, ненадежна.
   c) Число ошибок, которые нельзя обнаружить, бесконечно в противовес числу ошибок, которые можно определить — оно конечно по определению.
   d) В поиски повышения надежности будут вкладываться средства до тех пор, пока они не превысят величину убытков от неизбежных ошибок или пока кто-нибудь не потребует, чтобы была сделана хоть какая-то полезная работа.

5. Третий закон Грида. Машинная программа выполняет то, что вы ей приказали делать, а не то, что вы бы хотели, чтобы она делала.
6. Первая компьютерная аксиома Лео Бейзера. Закладывая что-то в память ЭВМ, помните, куда вы это положили.
7. Руководство по системному программированию Штейнбаха. Никогда не выявляйте в программе ошибки, если вы не знаете, что с ними дальше делать.
8. Закон Брука. Увеличение числа участников при подготовке опаздывающей программы только замедляет процесс.
9. Законы мира ЭВМ по Голубу.

a) Неточно спланированная программа требует в три раза больше времени, чем предполагалось; тщательно спланированная — только в два раза.
b) Работающая над программой группа питает отвращение к еженедельной отчетности о достигнутых результатах, поскольку она слишком явно свидетельствует об отсутствии таковых.

10. Принцип Шоу. Создайте систему, которой сможет пользоваться даже дурак, и только дурак захочет ею пользоваться.

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