20. Eyeing Earth: From
Cloud Top to Seabed(   ) 1. Earth scientists
are beginning to live what they once considered an impossible
dream. They are establishing systems to monitor our entire planet
continuously, from the outer fringes of the atmosphere to the
deepest seabed. They even are beginning to track the grinding of
rock upon rock that generates earthquakes. 1

2. They are linking communications systems to
shunt these data to whomever can work them into useful knowledge.
Often this now can be done in minutes instead of hours, days, or
weeks. An unprecedented cooperation is developing among nations
so that earth scientists will no longer look at our planet in the old,
fragmented way. 2

3. These technological developments
have brought humanity to the brink of "great opportunities," said
American Geophysical Union president John Orcutt at a meeting of

the group last week in San Francisco. A few of many instances of such opportunities presented at the meeting illustrate this. 3

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4. Scientists at the Scripps Institution of Oceanography in La Jolla, Calif., where Dr. Orcutt is deputy director, have developed a way to use the worldwide seismic observing network to image earthquake ruptures. Within 30 minutes or less, they can trace the entire crustal rupture that produces a quake anywhere in the world. This information is much more valuable than merely pinpointing the quake epicenter. "This is important for tsunami warning systems in which you need to know a path   not just the original location of an earthquake," explains Scripps scientist Peter Shearer. 4

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"   5. Meanwhile, in North America, the EarthScope project is establishing a continent-wide network of GPS locators, seismographs, and other instruments to study what's happening below the crust. 5

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6. The network, which will cover the United States and reach into Canada and Mexico, is beginning to track the interaction of the two great crustal plates that respectively carry the Pacific Ocean and the continent. Its prime feature is an observatory in Parkfield, Calif., which has placed instruments nearly two miles deep into the Earth right up against the San Andreas fault to record every creep, rattle, and grind. The goal is "to get into the heart of this earthquake machine" and test scientists' speculations as to how it works, says William Ellsworth, a geologist with the US Geological Survey in Menlo Park, Calif. 6

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7. Networks of satellites already on orbit or soon to be launched are beginning to provide detailed observations of the workings of the atmosphere, ocean, and continental crust over the entire planet. These data are shared globally through an unprecedented cooperation among 58 nations called the Global Earth Observation System of Systems. 7

Orcutt noted that it will take high-volume high-speed communications to make the most of such sharing. Such a system, now under development, will shunt data a thousand times faster than current "high speed" broadband Internet links. Orcutt added that a strong commercial incentive exists to develop this system. It would allow movie studios, for example, to transmit a digital motion picture directly to theaters, where it could be shown in real time. 8

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21. The art of public Speaking. 21   1. The need for effective public speaking will almost certainly touch you sometime in your life. When it does, you want to be ready. But even if you never give another speech in your life, you still have much to gain from studying public speaking. Your speech class will give you training in researching topics, organizing your ideas, and presenting yourself skillfully. The training is invaluable for every type of communication. 1

2. There are many similarities between public speaking and daily conversation. The three major goals of speaking-to inform, to persuade, to entertain-are also the three major goals of everyday conversation. In conversation, almost without thinking about it, you employ a wide range of skills. You organize your ideas logically. You tailor your message to your audience. You tell a story for maximum impact. You adapt to feedback from your listener. These are among the most important skills you will need for public speaking. 2

3. Of course, public speaking is also different from conversation. First, public speaking is more highly structured than conversation. It usually imposes strict time limitations on the speaker, and it requires more detailed preparation than dose ordinary conversation. Second, speechmaking requires more formal language. Listeners react negatively to speeches loaded with slang, jargon, and bad grammar. Third, public speaking demands a different method of delivery. Effective speakers adjust their voices to the larger audience and work at avoiding distracting physical mannerism and verbal habits. 3

4. One of the major concerns of students in any speech class is stage fright. Actually, most successful speakers are nervous before making a speech. Your speech class will give you an opportunity to gain confidence and make your nervousness work for you rather than against you. You will take a big step toward overcoming stage fright if you think positively, choose speech topics you really care about, prepare thoroughly, and concentrate on communicating with your audience. Like many students over the years, you too can develop confidence in your speechmaking abilities. 4

5. The speech communication process as a whole includes seven elements-speaker, message, channel, listener, feedback, interference, and situation. The speaker is the person who initiates a speech transaction. Whatever the speaker communicates is the message, which is sent by means of a particular channel. The listener receives the communicated message and may provide

feedback to the speaker. Interference is anything that impedes the communication of a message, and the situation is the time and place in which speech communication occurs. The interaction of these seven elements is what determines the outcome in any instance of speech communication. 5

6.

Because speechmaking is a form of power, it carries with it heavy ethical responsibilities. Ethical speakers use sound means to achieve sound goals. They do this by being well informed about their subjects by being honest in what they say, by using sound evidence, and by employing valid reasoning. 6

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