and information, announcing computer courses and so on, they would be users of the system on the same basis as other citizens. But they might have a special task and pleasure. Community Information offers the richest potential of full technological conviviality of anything on the horizon now. A full system would offer the user instruction on how to maintain, repair, modify and understand the hardware, and even more the software. *It would teach the user how to use it.*

This is a simple and dynamite proposition, with the most sophisticated implications for programming and programmers. The first level has been forseen in the initial tests of Community Memory: the machine says, "These are the categories of information I carry, this is how you call them up, how you enter material; please don't hit my keys too hard." But the higher levels have been anticipated only by the programmed injunction, "Touch me.", by which the machine, as an experienced lover, greets virgin.

Not simply how to handle information, but how to think about handling it, how to feel about using it — these are the potentials that open. We shall have a system with awesome potentials for use and play. How can the machine help the user learn to make the most of them? This

suggests learning programs of a kind and sophistication that have nowhere yet to be explored, a true challenge.

For it is not a known kind of learning which is to be taught, established routines of access and use; but rather the creative exploration and mastery of unknown potentials — both of the technological system itself, and of the individual identities and human community with which it grows in intimate interface. In this respect what the system's programmers will be responsible for facilitating is not the narrow learning of "how to use the computer terminal", but the ultimate act of learning about learning itself — providing perhaps the deepest dimension of that Community Information which empowers democratically.

Of course the system should be designed so that this teaching and learning can develop, again, in a democratic community interaction via the computerized prosthesis. But the seed the systems designers plant will help to determine what grows in the fertile soil.

Michael Rossman has been an active participant and observer in most of the events in the Bay Area which signalled the growth of a student- and youth-oriented political/social subculture. He has traveled and worked extensively around the country as an organizer for educational change. For more details see his two books, **The Wedding Within The War** and **On Learning and Social Change** (Vintage), both out of print.

Social Implications of Computer Technology

by G. K. GUPTA

G. K. Gupta is a member of the Department of Computer Science, Monash University, Clayton, Victoria 3168 Australia. Telegrams will reach him at Monashuni, Melbourne, Australia.

The course "Social Implications of Computer Technology" was designed for the final year undergraduate students of B.Sc. (Hons) computer science program at Monash University, Melbourne, Australia. The main aim of the course was to provide the students with an opportunity to discuss the social issues related with technology (in particular computer technology) and thus develop an awareness of the social implications of that technology.

Topics discussed were:
1. Data banks and privacy
2. Information utility
3. Computers and education
4. Computing education in high school
5. Computer literacy
6. Computers and Values
7. Computers and social power
8. Computers and politics
9. Computers and employment
10. Computer uses in military
11. Computers for national development
12. The computer industry
13. Patents and copyrights for programs
14. Computer and its affects on human self-understanding.

References used during the course were extensive. The list which follows may be of use to other *Computers & Society* readers.

1. ACM (1970) "Computers and Crisis — How computers are shaping our future", proceedings of 1970 ACM Annual Conference.
2. ACM Council (1975), "ACM Council urges legislative safeguards against misuse of UID's", Comm. ACM, Vol. 18, No. 1, p 68.
3. ACM Committee on Computers and Public Policy (1974), "A problem — list of issues concerning computers and public policy", Comm. ACM, Vol. 17, No. 9, pp 495 - 503.
4. ACS (1973), "Data banks and privacy", Australian Computer Journal, Vol. 5, No. 1, pp 39 - 41.
5. AUERBACH, I. L., (1974), "The information revolution — will it improve the quality of life", Proceedings of the 6th Australian Computer Conference, Vol. 3, pp 966 - 1011.
6. BARAN, P., (1970), "The future computer utility", in Taviss (1970), pp 81 - 92.

7. BLUM, A. A., (1970), "White Collar Workers", in Taviss (1970), pp 69 - 80.

8. BRECKENRIDGE, A. C., (1970), "The right to privacy", University of Nebraska Press, Lincoln.

9. BROCK, G. W., (1975), "The U. S. Computer industry: A study of market power", John Wiley and Sons.

10. BUSSELL, C., (1972), Ed., "Proceedings of Symposium on computer education for developing countries", Ao Livro Tecnico, Brazil.

11. CHARTRAND, R. L., (1972), Ed., "Computers in the service of Society", Pergamon Press.

12. CARROLL, J. D., (1971), "Participatory Technology", Science, Vol. 171, pp 647 - 653.

13. DENNING, P. J., (1975), "Objection to ACM's resolution on UID's", Comm. ACM, Vol. 18, No. 5, pp 303 - 304.

14. DIAL, O. E., (1970), "The social impact of computers", Proceedings of 1970 SJCC, AFIPS, pp 449 - 451.

15. DOYLE, L. B., and KRISTY, N. F., (1972), "Educational Problems", in Sackman and Borko (1972).

16. DREYFUS, H. L., (1972), "What Computers can't do: a critique of artificial reasoning", Harper and Row, New York.

17. FORD, G. W., (1974), "Computers and the quality of working life", Proceedings of the 6th Australian Computer Conference, pp 1012 - 1025.

18. FOY, N., (1975), "The Sun never sets on IBM: The culture and folklore of IBM world trade", William Morrow & Co., New York.

19. GOLDSWORTHY, A., (1972), "Data banks and privacy — with particular reference to Australia", Proceedings of the 5th Australian Computer Conference, pp 16 - 21.

20. GOLDSWORTHY, A., (1973), "Computers and privacy — A review of the Younger committee report", Australian Computer Journal, Vol. 5, No. 1, pp 3 - 7.

21. GOLDSWORTHY, A., (1974), "Privacy in Australia — The Morison report", Australian Computer Journal, Vol. 6, No. 1, pp 34 - 37.

22. GOTLIEB, C. C., and BORODIN, A., (1973), "Social issues in Computing", Academic Press.

23. GRUENBERGER, F., (1968), Ed., "Computers and Communications — towards a computer utility", Prentice Hall, Englewood Cliffs, N. J.

24. HARMAN, A. J., (1971), "The international computer industry", Harvard University Press, Cambridge, Mass.

25. HOFFMAN, L., (1969), "Computers and Privacy: A survey", Computing Surveys, Vol. 1, pp 85 - 103.

26. HOLMES, W. N., (1972), "The implications of standard identification numbers", Proceedings of 5th Australian Computer Conference, pp 352 - 359.

27. JONES, M., (1974), Ed., "Privacy", David & Charles.

28. KAYSEN, C., (1970), "The privacy question", in Taviss (1970), pp 161 - 168.

29. KLAPERMAN, J., (1972), "Computer services for individual consumers", in Sackman & Borko (1972).

30. MARTIN, J. and NORMAN, A. R. D., (1970), "The computerized society", Pelican Paperback (First published by Prentice Hall).

31. MAZLISH, B., (1970), "Social philosophy and World-view", in Taviss (1970), pp 276 - 288.

32. MICHAEL, D. N., (1970), "The privacy question", in Taviss (1970), pp 169 - 181.

33. MILLER, A. R., (1971a), "Federal data banks and the bill of rights", Computers and Automation, Vol. 20, No. 10, pp 12 - 18.

34. MILLER, A. R., (1971b), "The assault on privacy", University of Michigan Press.

35. MILLER, G. A., (1970), "Thought processes", in Taviss (1970), pp 217 - 230.

36. MUMFORD, E., and SACKMAN' H., (1974), Eds., "Human choice and computers", Proceedings of IFIP conference, North-Holland.

37. NIKOLAIEFF, G. A., (1970), "Computers and society", The H. W. Wilson Co.

38. PARKER, E. B. and DUNN, D. A., (1972), "Information Technology: its social potential", Science, Vol. 176, pp 1392 - 9.

39. PAXSON, E. W., (1972, "Computers and national security", in Sackman and Borko (1972).

40. PRESS, L. I., (1973), "Toward information processing literacy", Honeywell Computer Journal, Vol.7, p 7.

41. PRESS, L. I., (1974), "Towards information processing literacy — experience teaching programming," Proceedings of the 5th Conference on Computers in the Undergraduate Curricula, Pullman, Washington.

42. PRESS, L. I., (1974), "Arguments for a moratorium on the construction of a community information utility", Comm. ACM, Vol. 17, No. 12, pp 674 - 678.

43. PYLYSHYN, Z. W., (1970), Ed., "Perspectives on the Computer revolution", Prentice Hall, Englewood Cliffs, N. J.

44. RHEE, H. A., (1968), "Office automation in social perspective — the progress and social implications of EDP", Basil Blackwell.

45. ROTHMAN, A., and MOSMANN, C., (1972), "Computers and Society", Science Research Associates, Chicago.

46. ROWE, B., (1972), Ed., "Privacy, computers and you", National Computer Centre, London.

47. SACKMAN, H., and BORKO, H., (1972, Eds., "Computers and the problems of society", AFIPS Press, Montvale, N. J.

48. SACKMAN, H., and BOEHM, B., (1972), Eds., "Planning community information utilities", AFIPS Press, Montvale, N. J.

49. SACKMAN, H., and NIE, N., (1970), Eds., "The information utility and Social choice", AFIPS Press, Montvale, N. J.

50. SHEPARD, J. M., (1971), "Automation and alienation: A study of office and factory workers", MIT Press, Cambridge, Mass.

51. SMIGEL, E. O., (1970), "The leisure society", in Taviss (1970), pp 104 - 114.

52. STERLING, T., (1974), "Guidelines for humanizing computerized information systems — A report from Stanely House", Comm. ACM, Vol. 17, No. 11, pp 609 - 614.

53. TAVISS, I., (1970), Ed., "The computer impact", Prentice-Hall, Englewood Cliffs, N. J.

54. United Nations Dept. of Economic and Social Affairs (1973), "The application of computer technology for development",

55. U. S. Department of Health, Education and Welfare (1973), "Records, computers and the rights of citizens".

56. WARNER, M., and STONE, M., (1970), "The data bank society", George Allen and Unwin.

57. WEIZENBAUM, J., (1972), "On the impact of the computer on Society", Science, Vol. 176, pp 609 - 614.

58. WESTIN, A., (1960), "Information systems and political decision making" in Taviss (1970), pp,130 - 144.

59. WESTIN, A., (1971a), "Information technology in a democracy", Harvard University Press, Cambridge Mass.

60. WESTIN, A., (1971b), "Privacy and freedom", Atheneum Press, New York.

61. WESTIN, A., (1972b), Ed., "Data banks in free society", Quadrangle Books, Chicago.

Videotaped Computers Course Available

A 17 session computers and society course geared for a high level undergraduate or beginning graduate student level is now available on videotape. Developed at SUNY College of Arts and Sciences at Potsdam, the course, "Legal, Social and Psychological Aspects of Computers" has been prepared on black and white Quad tapes. Each session is recorded on a separate tape and may be used independently as supplementary material for a course, or in sequence as the lecture portion of a complete course. A panel format is employed in most sessions, enabling the instructor to draw on a variety of experts for comments and explication of social issues. Average time of each session tape is 45 minutes.

Although the tapes are available now, they will be even more useful when an introduction and follow-up to the series is ready in the spring of 1976. Copies of the tapes are available at cost of duplication and materials. Different sizes and qualities of tape are available. Questions and orders may be addressed to: John Dalphin, SUNY College of Arts and Sciences at Potsdam, Potsdam, NY 13676, (315) 268-2954.

UNESCO Study Released

A study for UNESCO, "The Computer's Role in Undergraduate Chemistry Education" has just been released for distribution to all member countries through the regional offices of the agency. Authored by former SIGCAS Chairman Peter Lykos, the study is intended for developing countries which plan to incorporate computing into science curricula in national colleges.

In the study Dr. Lykos reviews the affect of the computer on chemistry and on chemistry education both as an aid to teaching and as an enhancement to the doing of chemistry. Three course outlines are given: the computer in experimental chemistry, chemical information, and numerical methods in chemistry. Numerous examples of computer programs in use in many college and university chemistry departments are described briefly, including a simple approach to computer-assisted instruction in freshman chemistry. The interface between chemistry with computer science and engineering is considered, and computer related professional societies and their publications are listed as sources of films and slide talks which teach various aspects of computing. A model chemistry