Meetings

Primates: Communication and Social Interactions

"Fundamentally, the social sciences are the study of the means of communication between man and man or, more generally, in a community of any sort of beings" (Norbert Wiener). The concept of a society as a communication system has far-reaching research implications that we are just beginning to appreciate. It was not surprising, then, that an international symposium on communication and social interactions in primates was held in Montreal, Canada, 27–31 December 1964, during the annual meeting of the American Association for the Advancement of Science. Twenty-six speakers from seven countries discussed various aspects of social interactions in primates—the group of animals that includes not only man, but also the prosimians, monkeys, and apes.

A diversity of scientific disciplines was represented—anthropology (Itani, Ripley, Sade, Simonds, Sugiyama), psychology (Bernstein, Carpenter, Gartlan, Hall, Miller, Rosenblum, Warren), psychiatry and neurology (Jensen, Ploog, Rioch, Robinson), mathematics (J. Altmann), linguistics (Sebeok), and zoology (S. Altmann, Jolly, Kaufmann, Kummer, Moynihan, Rowell, Struhsaker, Vanderbergh). Clearly, the study of primate social behavior has not become the private domain of any one group of scientists. In view of the complexity of the subject matter, this is fortunate.

The discussions had a wide range. This was true not only of the aspects of social behavior that were investigated, but also of the species of primates with which these scientists experimented. Bernstein presented a comparison of social responses in nine species of primates. Two species of prosimian primates, the aye-aye and the ring-tailed lemur, were discussed by Petter and Jolly, respectively. The New World monkeys were represented by material on howlers (S. Altmann and Carpenter) and titi monkeys (Moynihan); Ploog's report on studies of squirrel monkeys was presented by title at the symposium.

Not unexpectedly, the Old World monkeys were the most frequent subjects of research. However, this research is no longer devoted solely to rhesus. Although there were reports on this species (in studies presented by Kaufmann, Koford, Miller, Robinson, Rowell, Sade, and Vanderbergh), there were also reports on studies of Japanese macaques (Itani, Tsumori), pigtail macaques (Jensen, Rosenblum), bonnet macaques (Rosenblum, Simonds), hamadryas baboons (Kummer), sub-Saharan baboons (J. Altmann, Hall, Rowell), vervets (Gartlan, Struhsaker), patas (Hall), and langurs (Ripley, Sugiyama).

The great apes were represented by George Schaller's film on the mountain gorilla and Jane Goodall's film on chimpanzees. The latter was shown after the last session of the symposium by the National Geographic Society as their annual film presentation.

Many aspects of the behavior of these primates were discussed—the neurological and physiological concomitants of behavior (Miller, Ploog, Robinson), ontogeny (Jenson, Rosenblum), dominance, aggression, and subordination (J. Altmann, Gartlan, Kaufmann, Kummer, Sade), social signaling (S. Altmann, Hall, Itani, Moynihan, Struhsaker), reproductive behavior (Jolly, Rowell), social dynamics (Bernstein, Petter, Ripley, Sugiyama, Tsumori, Vandenbergh), and general research strategy (Carpenter). This profusion of species and of aspects under study was an indication of two healthy research trends in this area. Primate behavior is being studied both in its many guises and along its many frontiers. In both respects, the study of primate behavior is one of the most rapidly developing areas of biological research.

Despite this great diversity of subject matter and approach, certain major themes developed as the symposium progressed. One is that primate societies are both varied and variable. Changes in behavior may come as a result of an annual breeding season (Jolly), the female's estrus cycle (Rowell), the formation of new groups (Vanderbergh), or the take-over of an existing group by a new adult male (Sugiyama). Relatively small changes in the social and physical environment of infant primates may significantly affect their later behavior (Jensen, Rosenblum) and thereby considerably alter the social structure.

Differences between species of primates may be even greater than such intraspecific variations. The contrasts are striking between, for example, the nocturnal, one-family groups of aye-ayes (described by Petter), the one-male, multi-female groups of patas monkeys (described by Hall), and the multi-male, multi-female groups of baboons and macaques (described by several participants).

The symposium revealed a strong trend toward naturalistic or biological approaches; these were, in many cases, explicitly evolutionary. When one considers the diversity of the speakers' fields, this trend is quite remarkable. It was evident in repeated discussions of the problem of natural units of social behavior. Beyond that, this trend toward a naturalistic perspective was revealed in the fact that even those who had carried out the most abstracted and minute analyses of behavior in laboratory settings were both aware of and interested in the extent to which their results were relevant to an understanding of how these animals solve their own, naturally occurring problems, and the extent to which their experimental set-up provided an adequate paradigm of processes of adaptation.

Another research trend revealed by the symposium was the tendency toward quantitative studies. For a number of species of primates, the initial, descriptive phase in the research cycle has advanced sufficiently far, in both field and laboratory, that more exact analysis can now be carried out. Such analysis is particularly important and fruitful when dealing with primates, in part because their behavior is so multiply contingent and hence highly variable, and in part because of the complex, multi-individual interactions that occur within primate social groups.

One last trend in research on pri-

mate behavior revealed by the symposium was so pervasive as to pass almost unnoticed. No one, either among the participants or the audience, was sufficiently impressed to comment on such seeming incongruities as a psychiatrist and a zoologist discussing infant development, a linguist and a zoologist discussing communication in monkeys, or a mathematician and an anthropologist discussing the control of aggression. It would seem that, in studies of animals of this group at least, the old barriers to communication between members of various scientific disciplines are, if not dead, at least moribund.

Some of the funds for the symposium were provided by a grant (GB 2870) from the National Science Foundation. Results of the symposium will be published later this year by the University of Chicago Press, in a book entitled *Social Communication Among Primates*, Stuart A. Altmann, Ed.

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Forthcoming Events

August

28–29. International **Transactional Analysis** Assoc., 3rd summer conf., Monterey, Calif. (E. Berne, P.O. Box 5747, Carmel, Calif.)

29–2. American Assoc. of **Clinical Chemists,** 17th natl., Chicago, Ill. (M. E. Hanke, 8424 Rhodes Ave., Chicago)

29–2. **Illuminating Engineering** Soc., New York, N.Y. (A. D. Hinckley, 345 East 47 St., New York 10017)

29–3. AAAS, Laurentian **Hormone** Conf., Mont Tremblant, Quebec, Canada. (J. C. Foss, Laurentian Hormone Conf., 222 Maple Ave., Shrewsbury, Mass.)

29–10. **Forest Hydrology**, intern. symp., Pennsylvania State Univ., University Park. (W. E. Sopper, School of Forestry, Pennsylvania State Univ., University Park)

30–31. **Past and Future of Science**, symp., Krakow, Poland. (B. Suchodolski, Polish Acad. of Sciences, Palace of Culture and Sciences, Warsaw)

30–1. **Antennas and Propagation**, intern. symp., Washington, D.C. (R. J. Adams, Code 5330, U.S. Naval Research Laboratory, Washington 20390)

30–1. Applied **Mechanics**, West Coast conf., Univ. of California, Los Angeles. (P. M. Naghdi, Div. of Applied Mechanics, Univ. of California, Berkeley 94720)

30–1. **Rare Earth Research,** 5th conf., Iowa State Univ., Ames. (S. Legvold, Dept. of Physics, Iowa State Univ., Ames)

30–1. **Structural Dynamics and Aeroelasticity**, conf., Boston, Mass. (F. C. Hung, Space Information Systems Div., North American Aviation, Inc., Downey, Calif.)

30–2. **Fluorine Chemistry**, 3rd intern. symp., Munich, Germany. (F. Weygand, Inst. für Organische Chemie, Technische Hochschule München, Arcisstr. 21, 8 Munich 2)

30–2. **Mathematical** Assoc. of America, 46th summer, Cornell Univ., Ithaca, N.Y. (H. M. Gehman, State University of New York at Buffalo, Buffalo 14214)

30–2. **Regional Science** Assoc., 5th European congr., Krakow, Poland. (H. Wood, Dept. of Regional Science, Univ. of Pennsylvania, Philadelphia 19104)

30–2. American **Sociological** Assoc., Chicago, Ill. (G. M. Sykes, ASA, 1755 Massachusetts Ave., NW, Washington, D.C.)

30–3. **Neuropathology**, 5th intern. congr., Zurich, Switzerland. (O. T. Bailey, 912 S. Wood St., Chicago, Ill. 60612)

30–3. **Nuclear Materials Management**, intern. symp., Vienna, Austria. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C.)

30–3. Society for Applied **Spectroscopy**, 4th natl., Denver, Colo. (M. W. Skougstad, 215 Hewitt Bldg., Denver 80202)

30–4. **Ionization Phenomena** in Gases, 7th intern. conf., Belgrade, Yugoslavia. (Organizing Committee, Studentski trg. 16/C/IV, P.O.B. 699, Belgrade)

30–4. **Macromolecular Chemistry**, intern. symp., Prague, Czechoslovakia. (O. Wichterle, 1888 Petriny, Prague 6)

30–4. **Organometallic Chemistry**, 2nd intern. symp., Madison, Wis. (R. West, Dept. of Chemistry, Univ. of Wisconsin, Madison)

30–10. **Population**, 2nd world conf., Belgrade, Yugoslavia. (United Nations Population Commission, New York)

30–10. International Inst. of **Refrigeration**, symp., Prague and other cities, Czechoslovakia. (Organizing Committee, Prague 5-Smíchov, Ostrovského 34, Czechoslovakia)

31–11. **Information Theory**, Statistical Decision Functions and Random Processes, 4th conf., Prague, Czechoslovakia. (F. Hrabal, Foreign Relations Dept., Czechoslovak Acad. of Sciences, Narodni tr. 3, Prague 1)

September

1–3. American **Geophysical** Union, 5th western natl. meeting, Dallas, Tex. (AGU, 1145 19th St., NW, Washington, D.C.)

1–3. **Metallurgists**, 4th annual conf., Ottawa, Ont. (Canadian Inst. of Mining and Metallurgy, 906 Drummond Bldg., 117 St. Catherine St. W., Montreal, Que.)

1–3. Biomedical Aspects of **Shock and Vibration Technology**, symp., Denver, Colo. (E. R. Wilson, 5745 S. Huron St., Littleton, Colo. 80120)

1–4. **Aeronautics**, 6th European congr., Munich, Germany. (Wissenschaftliche Gesellschaft für Luft und Raumfahrt, Martinstr. 40–42, 5 Cologne)

1–4. International Assoc. of **Gerontology**, European Clinical section, 4th congr., San Remo, Italy. (A. Zilli, Viale Morgagin 85, Florence, Italy)

1–4. **Immunological Methods**, symp., Chantilly, France. (R. H. Regamey, Intern. Assoc. of Microbiological Societies, Inst. d'Hygiene, 1200 Geneva, Switzerland)

1–4. Society of General **Physiologists**, 20th annual, Marine Biological Laboratory, Woods Hole, Mass. (R. Milkman, Dept. of Zoology, Syracuse Univ., Syracuse, N.Y. 13210)

1–5. **Regional Science** Assoc., 5th European congr., Warsaw, Poland. (H. Wood, Dept. of Regional Science, Univ. of Pennsylvania, Philadelphia 19104)

1–8. **History of Pharmacy**, intern. congr., London, England. (A. L. Short, Pharmaceutical Soc. of Great Britain, 17 Bloomsbury Sq., London W.C.1)

1–9. **Physiological Sciences**, 23rd intern. congr., Tokyo, Japan. (G. Kato, Dept. of Physiology, Keio Univ. School of Medicine, Shinjuku-ku, Tokyo)

1–14. **Cosmical Gas Dynamics**, 5th symp., Nice, France. (M. Roy, Intern. Union of Theoretical and Applied Mechanics, 55, boul. Malesherbes, Paris 8e, France)

1–17. **Algebraic Number Theory**, instructional conf., Brighton, England. (R. R. Laxton, Mathematics Div., Physics Bldg., Univ. of Sussex, Brighton)

2–4. American **Physical** Soc., Honolulu, Hawaii. (K. K. Darrow, APS, Columbia Univ., New York 10027)

2–5. International Medical Assoc. for the Study of **Living Conditions and Health**, 4th world congr., Karlovy Vary, Czechoslovakia. (Secretariat, Apolinárská 18, Prague 2)

2–9. German **Mineralogical** Soc., 43rd, Hanover, Germany. (F. Buschendorf, Mineralogisches Inst., Technische Hochschule Hanover, Welfengarten 1, 3 Hanover)

3–7. American **Psychological** Assoc., 73rd annual, Chicago, Ill. (The Association, 17th and Rhode Island Ave., NW, Washington, D.C.)

5–7. **Water Pollution**, 3rd intern. conf., Munich, Germany. (B. B. Berger, P.O. Box 1907, Washington, D.C.)

5–8. Federation of French-Speaking Societies of **Gynaecology and Obstetrics**, 21st congr., Lausanne, Switzerland. (P. Bloch, Hopital Cantonal, Lausanne)

5–8. **Mathematics**, 7th Canadian congr., Quebec, Canada. (The Congress, 985 Sherbrook St. W., Montreal, Que.)

5–9. **Allergology**, 6th European congr., Stockholm, Sweden. (S. Kraepelien, Sachs Children's Hospital, Stockholm)

5–9. **Biochemistry of Lipids**, 9th intern. congr., Noordwijk, Netherlands. (J. Boldingh, Unilever Research Laboratorium, Mercatorweg 2, Vlaardingen, Netherlands)

5–9. **Luminescence**, symp., Munich, Germany. (N. Riehl, Arcisstr. 21, 8 München, Germany)

5–9. International League Against **Rheumatism**, 11th congr., Buenos Aires, Argentina. (A Caruso, Juncal 1875, Planta Baja, Depto. 2, Buenos Aires)

5–9. Physics and Chemistry of **Scintillators**, intern. luminescence symp., Munich, Germany. (H. Kallman, Radiation and Solid State Laboratory, Dept. of Physics, New York Univ., New York 3)

5–10. International Committee of **Electrochemical Thermodynamics and Kinetics,**