

A new social science

Geologists see their profession as embarked now on one of the most exciting periods of its relatively brief history.

But while basic discoveries and unifying hypotheses about the earth (SN: 11/8, p. 419) accumulate with pleasing rapidity, a number of geologists along with scientists in other fields, are finding themselves less than what the current sociological jargon calls "relevant." They see the need for geology to become a more human-oriented, problem-centered enterprise.

This trend, expressed during this week's meeting of the Geological Society of America in Atlantic City, could all be an intentional response to cuts in Federal spending for programs that are neither military nor social.

More likely, though, the new orientation represents a more subtle response to generally shifting social attitudes.

"I think this is the greatest time for the earth sciences since the exploration of the American West," says Dr. William T. Pecora, director of the U.S. Geological Survey. Yet he and other speakers took pains to point out that geology is going to be interacting more and more with human affairs. More attention, they emphasize, will have to be paid toward applying geological knowledge to mankind's needs.

One such area is the relatively new field, variously described as environmental or urban geology. The Geological Survey and many scientists are striving to focus attention on the need for the growth of this as a new scientific discipline, dealing with the application of the knowledge of geology to a more enlightened involvement of man with his physical environment.

The redefinition of geology as a kind of social science is not easy. But there are examples offered of where it might be done.

For example: Population pressures are encouraging construction in areas where the geology is less stable. Geologists have the knowledge the architects, engineers and planners need to accommodate to a site's danger signals.

By the time the final design of a structure is completed, says Dr. Richard H. Jahns of Stanford University, the geologist should already have made his contribution. "Characterization of geologic hazards is one of the great challenges to geologists today," he says.

Engineering projects along coastlines are another area where geologists' foreknowledge of fast-paced geologic change could be valuable. Dr. Peter T. Flawn and his colleagues at

the University of Texas' Bureau of Econo- mical Geology are making an effort —represented so far by an Environmental Geological Atlas of the Texas Coast now being prepared. This will identify features such as areas of wide-scale erosion of soil into coastal waters as a result of human activities, and it is expected to be a valuable tool to land use planning in the coastal zone.

So far only a few universities are offering courses in environmental geology. But GSA president Dr. Morgan J. Davis would like to see the day when every university in the country offers environmental geology.

"Usually, geology has been more interested in the pre-Cambrian than the present," says Dr. Davis. "But as professional geologists we have or should have the prime responsibility for upgrading the quality of our terrestrial environment." □

SPACE SCIENCE

Plea for more astronomy

If the National Aeronautics and Space Administration is going to do any science, that science will most naturally be astronomy. But space astronomy, which involves costly hardware to launch observatories, leaves a minimum of science for the money spent.

For a \$40 million investment in a single orbiting observatory, for instance, \$6 million comes off the top for the rocket, and another \$17 million for the satellite. That leaves less than half for the scientific instrumentation itself.

So the National Aeronautics and Space Administration's Astronomy Missions Board—an assembly of 19 astronomers under the chairmanship of Dr. Leo Goldberg of Harvard, is advocating a sharp increase in NASA's astronomical programs. The board has put forth two programs for future astronomical work by the space agency: "a minimum balanced program" and an optimum one. The minimum program would cost about \$250 million per year in five years; the optimum about \$500 million a year. Present astronomy expenditures by the space agency average about \$125 million a year.

In general the board recommended increased observations in ranges impossible or difficult from the ground. These include long-wave radio, infrared, ultraviolet, X-ray and gamma ray astronomy. It asked for more sophisticated satellites and probes for solar, planetary and cosmic ray studies and it endorsed construction of a large space telescope by the middle 1980's.

Paying the cost

Vaccination has all but eliminated such infectious diseases as diphtheria, whooping cough and tetanus, and has brought about the gradual disappearance of polio. Nevertheless, with world travel as easy as it is now, protection against communicable diseases remains a problem, and vaccines have had to be made more potent to increase their effectiveness.

As the potency increases, the adverse reactions—especially in infants—also increase.

The problem has become so serious that risk-benefit ratios are being re-evaluated.

According to the Nov. 8 BRITISH MEDICAL JOURNAL, the British, for example, had considered discontinuing the whooping cough vaccine, but concluded that if it were abandoned the disease would be prevalent within a few years. Dr. David J. Sencer, head of the U.S. National Communicable Disease Center, Atlanta, and chairman of the Public Health Advisory Committee, agrees, and insists that the advantages of vaccination far outweigh the disadvantages.

But the problem may not be an entirely medical one. A recent court decision, holding Parke, Davis and Co. liable to the tune of \$651,783, for injury to a vaccinated infant, raises an issue which, if it does not tip the scales, will certainly influence the future of vaccinations.

The case, brought before the Second Circuit Court of Appeals in New York, involved a two-month infant vaccinated with Quadrigen, a vaccine combining diphtheria, tetanus, whooping cough and polio. After the vaccination, the infant was unable to walk or talk, was incapable of toilet training and extremely mentally retarded.

The law allows a patient to bring suit against drug manufacturers based either on negligent manufacturing or guarantee of the purity of and fitness of the product. The judge in the Parke, Davis case ruled that Quadrigen was defective, thus causing a high fever which in turn caused brain damage in the baby, and the damages award was made. No proof of an allergic reaction to Quadrigen was found, but, says Dr. William J. Curran, professor of legal medicine at Harvard School of Public Health and adviser to the National Communicable Disease Center, the reaction didn't have to be caused by a defective vaccine, although the court ruled that way.

The Parke, Davis case does not create precedent, but it is the latest in a series of assaults against drug com-