MCAT to Stress Thinking, Writing

A new version of the Medical College Admissions Test (MCAT), containing the first major revisions since 1977, is scheduled to replace the old one in 1991. The revised test is intended to place greater weight on breadth of academic background, reasoning skills, and writing ability of future physicians.

According to the Association of American Medical Colleges (AAMC), which announced the revisions on 13 March, the test will be shortened and reduced from six to four sections. The two content-specific sections, on biology and physics, will absorb items on chemistry. Multiple-choice questions will be eliminated and all content will be tested in a problem-solving format. A section on verbal reasoning will tap logic, comprehension, and critical thinking skills, based on texts selected from the humanities and social and natural sciences.

Finally, the MCAT will present the first graded essay questions to be included in a professional admissions test. These will be two half-hour questions, to be graded alphabetically to discourage lumping the results with the other sections. A sample essay task would be to explain and comment on the following: "In matters of principle, stand like a rock; in matters of taste, swim with the current." Controversial topics will be avoided because an essay on education and the modern woman, for example, might elicit good writing but bad ideas.

According to AAMC president Robert G. Petersdorf, it is anticipated that the new test will encourage more non-science majors to apply to medical school, as well as influence those who intend to go into medicine to take more diversified undergraduate courses.

Field testing will continue through next year. The test's predictive validity and its overall level of difficulty are expected to remain about the same. Although minorities generally score more poorly than whites on tests of reasoning ability, the essay question is expected to be relatively more "user friendly" for minorities, said Bruce Ballard of Cornell University Medical College's Equal Opportunity Programs.

The trend away from rote learning and toward the enhancement of reasoning and communications skills has also spurred revisions in the two major college admissions tests, the Scholastic Aptitude Test (SAT) and the American College of Testing (ACT) exam.

Proposed revisions for the SAT, which administered to 1.1 million high school students a year, mostly on the East and West coasts, are now being subjected to a 3-year joint review by the Educational Testing Service and its major client, the College Entrance Examination Board. Larry Litten of the College Board says the main reasons for the changes are the widespread deficiency in writing and critical reading skills among entering college students, and the need for more detailed information for student assessment and placement.

Test makers are contemplating adding a third score, in addition to the math and verbal scores, on a graded essay question. (The SAT added an essay in the mid-1970s but it is not included in the overall scores.) Sections on analogies and antonyms will be shortened or eliminated to make way for reading tests that measure reasoning and verbal skills in a more realistic context. The math section will also be expanded, and will no longer be exclusively multiple choice. Some items will require students to construct their own answer.

The ACT, administered to over 800,000 students, mostly in the Midwest and South, has completed its first major revision in 30 years. Following a 5-year review, it plans to administer the new version of its test next fall.

The ACT is basically becoming more SAT-like in that there will be a shift in emphasis from facts to reasoning skills. Sections measuring factual knowledge in the social studies and natural sciences will be replaced by tests of reading comprehension and science problem-solving. The number of scores will be increased from 5 to 12.

The math section has been expanded. A new science reasoning test will contain summaries, graphs, and tables presenting all the information necessary to answer the questions. The English section will pay less attention to mechanics and more on logic, organization, and style. There will be a new reading test with passages from fiction, the humanities, and science.

Spokespeople for both tests say they are not supposed to get any harder; neither will the revisions alter the relative standing of minorities or women.

■ CONSTANCE HOLDEN

Unesco Seeks Role in Genome Projects

Paris

The United Nations Education, Scientific, and Cultural Organization (Unesco) is seeking to play a central role in coordinating global research efforts into the mapping and sequencing of the human genome. In particular, it wants to focus its activities on the ethical questions raised by such research, and on increasing the involvement of scientists from Third World countries.

Unesco director-general Federico Mayor, a former biochemist, is planning to propose to the agency's 148 member states that the agency allocate $500,000 over the next 2 years to support such activities.

The money would be used, in part, to provide fellowships and travel grants to enable scientists from developing countries to visit laboratories in the industrialized world to learn about mapping and sequencing techniques. It would also support the distribution in both developed and Third World countries of information about the research programs.

"The money is just a drop in the ocean compared to that which has already been committed in the U.S. and elsewhere," says former Unesco staff member José Jaz, now a consultant to Mayor on the proposal. "But it would allow Unesco to act as a clearinghouse for information."

Unesco's interest in coordinating activities relating to human genome research has received encouragement from several members of the recently formed Human Genome Organization (HUGO), including its president, Victor McKusick of Johns Hopkins University in Baltimore. HUGO is a looseknit international group of scientists involved in genome sequencing projects. An offer from Unesco to house the European office of HUGO was turned down on the grounds that plans are being developed to situate this office in London. Unesco apparently is keen to play a role in helping ensure the genuine "globalization" of the research program.

Mayor, who helped secure the agency's support for a meeting held in Valencia last October to discuss the scientific and technological basis of future genome sequencing projects, has established an advisory panel of 20 leading scientists in the field. It includes McKusick; French Nobel laureate Jean Dausset, the director of the Centre des Etudes du Polymorphisme Humaine in Paris; and molecular biologist A. A. Bayev of the U.S.S.R. Academy of Sciences, which has recently started its own, relatively modest, program of genome sequencing and mapping.

A further meeting will be held in Moscow

at the end of June, at which it is hoped that detailed proposals will be worked out for submission to Unesco's General Conference in October. Unesco itself clearly is hoping that a close association with the topical field of human genome research will raise its profile as an international scientific organization; and that this in turn will help persuade both the United States, which left the organization at the beginning of 1985, and Britain, which followed a year later, to rejoin.

Meanwhile, the European Commission in Brussels is revising its plans for a 3-year, $18-million research program aimed at boosting European research into the human genome in light of a number of amendments proposed by the European Parliament. The Parliament wants the Commission to increase its support for studies of the social and ethical aspects of the research, and for public information campaigns on both its benefits and potential dangers. Despite objections from the new commissioner for research, Fillipo Pandolfi, the Parliament overwhelmingly approved virtually all of the amendments, which had earlier been passed by its energy and research committee (*Science,* 3 February, p. 599).

It is now up to the Council of Ministers, representing the governments of the 12 member states, to decide how many of these amendments should be included in the Commission's revised program. One amendment the Commission has already said it will adopt is to change the program's name from "predictive medicine" to the apparently less-threatening title of "human genome analysis."

One specific proposal made by the European Parliament is that at least 10% of the training contracts funded under the new program should be earmarked for research workers from developing countries.

■ DAVID DICKSON

NAE Elects New Members

The National Academy of Engineering has elected 90 new members and 7 foreign associates. This brings the U.S. total membership to 1484 and the foreign associates total to 122. The new members are:

Charles A. Amann, General Motors Research Laboratories, Warren, MI; **Stig A. Annestrand,** Battelle Pacific Northwest Laboratories, Portland, OR; **Frank F. Aplan,** Pennsylvania State University, University Park; **David H. Archer,** Westinghouse Electric Corp., Pittsburgh, PA; **Ali S. Argon,** Massachusetts Institute of Technology; **David H. Auston,** Columbia University; **Robert G. Bea,** PMB Systems Engineering Inc., San Francisco; **George A. Bekey,** University of Southern California; **John A. Betti,** Ford Motor Co., Dearborn, MI; **John R. Beyster,** Science Applications International Corp., San Diego; **Joel S. Birnbaum,** Hewlett-Packard Laboratories, Palo Alto; **Geoffrey Boothroyd,** University of Rhode Island, Kingston; **James J. Carberry,** University of Notre Dame; **Robert P. Caren,** Lockheed Corp., Calabasas, CA; **John R. Casani,** Jet Propulsion Laboratory, Pasadena; **Rodney J. Clifton,** Brown University; **Lynn A. Conway,** University of Michigan, Ann Arbor; **Richard W. Damon,** consultant, Concord, MA; **Stephen W. Director,** Carnegie Mellon University; **Frederick J. Doyle,** U.S. Geological Survey, Reston, VA; **Edsel D. Dunford,** TRW Space and Defense, Redondo Beach, CA; **Russell D. Dupuis,** AT&T Bell Laboratories, Murray Hill, NJ.

Robert J. Eaton, General Motors Corp.; **Charles Elachi,** Jet Propulsion Laboratory. **Thomas V. Falkie,** Berwind Natural Resource Co., Philadelphia; **Frank F. Fang,** IBM Thomas J. Watson Research Center; Yorktown Heights, NY; **Robert E. Fischell,** The Johns Hopkins University; **Robert C. Forney,** E. I. du Pont de Nemours & Co., Wilmington, DE; **Harold K. Forsen,** Bechtel National Inc., San Francisco; **Elsa Garmire,** University of Southern California; **David B. Geselowitz,** Pennsylvania State University; **Jerome B. Gilbert,** East Bay Municipal Utility District, Oakland, CA; **Alan J. Goldman,** The Johns Hopkins University; **Werner Goldsmith,** University of California, Berkeley; **H. J. Gruy,** Gruy Engineering Corp., Houston, TX; **Keith E. Gubbins,** Cornell University; **Carl W. Hall,** National Science Foundation; **Juris Hartmanis,** Cornell University; **Michael Hatzakis,** IBM Thomas J. Watson Research Center; **Donald P. Hearth,** University of Colorado, Boulder; **L. Louis Hegedus,** W. R. Grace & Co., Columbia, MD; **Robert J. Hermann,** United Technologies Corp., Hartford, CT; **George R. Hill,** University of Utah, Salt Lake City; **Lester A. Hoel,** University of Virginia, Charlottesville; **John E. Hopcroft,** Cornell University.

I. M. Idriss, Woodward Clyde Consultants, Oakland, CA; **Gunther F. Joklik,** BP Minerals America, Salt Lake City; **Willem J. Kolff,** University of Utah; **Edward J. Kramer,** Cornell University. **John D. C. Little,** Massachusetts Institute of Technology; **Daniel P. Loucks,** Cornell University; **Robert F. Mast,** ABAM Engineers Inc., Federal Way, WA; **Shiro Matsuoka,** AT&T Bell Laboratories; **Frank W. McBee, Jr.,** Tracor, Inc., Austin, TX; **John C. McDonald,** Contel Corp., New York City; **Marvin L. Minsky,** Massachusetts Institute of Technology; **James W. Mitchell,** AT&T Bell Laboratories; **Richard K. Moore,** University of Kansas Center for Research, Inc., Lawrence; **Arun N. Netravali,** AT&T Bell Laboratories; **John N. Newman,** Massachusetts Institute of Technology; **Robert E. Newnham,** Pennsylvania State University; **Ronald P. Nordgren,** Shell Development Co., Houston, TX; **Charles R. O'Melia,** The Johns Hopkins University; **Clarkson H. Oglesby,** Stanford University; **Robert H. Rediker,** Massachusetts Institute of Technology; **Ronald A. Rohrer,** Carnegie Mellon University; **Elbert L. Rutan,** Scaled Composites Inc., Mojave, CA.

Harold N. Scherer, Jr., American Electric Power Service Corp., Columbus, OH; **Alan Schriesheim,** Argonne National Laboratory; **Frank J. Schuh,** Drilling Technology, Inc., Plano, TX; **Laurence C. Seifert,** AT&T, Berkeley Heights, NJ; **Michael L. Shuler,** Cornell University; **A. M. O. Smith,** consultant, San Marino, CA; **Henry I. Smith,** Massachusetts Institute of Technology; **James J. Solberg,** Purdue University; **Richard G. Strauch,** Wave Propagation Laboratory, Boulder, CO; **Al F. Tasch, Jr.,** University of Texas, Austin; **Larry F. Thompson,** AT&T Bell Laboratories; **Philip A. Thompson,** Rensselaer Polytechnic Institute; **Charles E. Till,** Argonne National Laboratory; **Jeffrey D. Ullman,** Stanford University; **Jan van Schilfgaarde,** U.S. Department of Agriculture, Fort Collins, CO; **Kuo-king Wang,** Cornell University; **William J. Ward, III,** GE Corporate Research and Development Center, Schenectady; **James E. White,** Colorado School of Mines, Golden; **Robert M. White,** Control Data Corp., Minneapolis; **Paul A. Witherspoon, Jr.,** University of California, Berkeley; **Jerry M. Woodall,** IBM Thomas J. Watson Research Center; **Israel J. Wygnanski,** University of Arizona, Tucson; **Tobey A. Yu,** Orba Corp., Mountain Lakes, NJ.

The new foreign associates are:

Henrik Ager-Hanssen, Den Norske Stats Oljeselskap AS (STATOIL), Stavanger, Norway; **Umberto Colombo,** Italian National Commission for Nuclear and Alternative Sources, Rome; **Konstantin Vasilevich Frolov,** Mechanical Engineering Research Institute, Moscow, U.S.S.R.; **Hans List,** AVL Gessellschaft fur Verbrennungskraftmaschinen und Mess Technik MbH., Graz, Austria; **Roddam Narasimha,** National Aeronautical Laboratory of India, Bangalore; **Fernando Vasco Costa,** Harbour Works, Lisbon, Portugal; **Moshe Zakai,** faculty of electrical engineering, Haifa, Israel.