Science for the Misses

One of the conclusions reached by James B. Conant in his recent report on American high schools is that academically talented girls are not receiving satisfactory guidance. Studying in detail a group of 22 better-than-average high schools, Conant found that in most of the schools a majority of the academically talented boys are taking at least seven years of science and mathematics during four high-school years, while in none of the schools are a majority of the more able girls taking seven years of science and mathematics. From some viewpoints the guidance at present offered able girls in the schools should be changed, but from the viewpoint of women now seeking full, constructive lives as scientists, engineers, or mathematicians, the present guidance makes sense.

To discourage girls from going into science may be realistic because, as observers note, women are discriminated against in this field. They have less chance than men of being employed at their full potential, and they are employed at lower salaries. The attitude in the schools reflects the attitude in the adult world. Only boys and men may profitably study mechanical things and scientific ideas; girls and women will find them too difficult. Or, to put the general consensus even more briefly, men are better than women.

Whatever the present attitudes, the battle of the sexes is not yet over. Improvement in opportunities for girls who become scientists, engineers, or mathematicians may occur, perforce, because of increases in the demand for specialized talent. There is every expectation that excellence in science will play an increasingly important role in the contest between East and West as well as in our expanding civilian economy. As to how this country now stands in relation to the Soviet Union, a number of observers have compared unfavorably our present use of able women with theirs, particularly in engineering and medicine.

To seek a change in those attitudes that put a limit on the achievements of women over and above the limit set by abilities is not to forget that girls become women and women get married and raise children. The employment of women does raise problems not raised by the employment of men. More liberal personnel policies may be necessary, especially as they bear on leaves of absence, part-time schedules, and travel requirements. But if life becomes a little less convenient for the employer, in a field like that of research it can still be readily managed.

On the question of men, women, and careers, we must confess that we have our prejudices, too. We like to see talent encouraged whether it is possessed by a boy or a girl, and whether the talent is in science or in some other field of endeavor. That the employment of more women is part of the answer to growing demands for technological manpower seems to us clearly proved, but we see a manpower shortage less as a reason for employing women in science than as a good argument for putting able women where they should be in any case. Increases in demand for specialized talent may be just the thing to stop the cycle in which the lack of education of able women means poor opportunities, and poor opportunities mean less motivation to seek more education.—J.T.
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Letters

(Continued from page 746)

The first comment by Donald Ross Green is meaningless because I did not make the statements or accusations he is refuting. My argument was directed toward getting rid of the arbitrary regulations—not the educationists themselves and their courses. Even Green concedes farther on in his letter that almost all educationists he knows “agree that certification requirements are sometimes arbitrary, rigid, and excessive.” Toward the end he refers to the body of knowledge resulting from study and research in the past 50 years, but what is he concerned about? Surely sound scholarly education courses based on that research and knowledge would survive on merit without artificial support by excessive and arbitrary legal requirements.

I stated essentially that most great teachers of the past and present never had any courses in an education department. Green states that “most of our finest contemporary teachers have taken education courses.” Ignoring a possible quibble over the word most, both statements are correct, but taken together they lead to the conclusion that education courses are not vital to the making of good science teachers; they may help and often do help, but their contribution is auxiliary and not dominant. The trouble is that an important segment of educationists won’t play the auxiliary role of helping educated people to teach others. They insist on dominating the whole stage. They are appalled at the suggestion that the experts in the field of science should have an important voice in deciding who shall teach science.

My statement that capable teachers are barred from public schools by present requirements ignored provisional certification. So granted: the superior scholar and teacher is not technically barred but may teach provisionally. This only proves that under present law in most states the President’s science advisor can get provisional certification—the provision being, of course, that he bone up at night and in the summer in the education department until his “deficiencies” are made up! It is still a sorry situation that merely emphasizes the importance of reducing excessive requirements. To meet the requirement in education courses is hard for the student who considers teaching late in his academic career. He is in a jam for time. The graduate student likewise is out of luck. He looks at the “provisions” of the provisional certificate and decides to do something else; he is, in effect, barred from teaching in the public schools.

These ridiculous situations could be solved through legislation recognizing science-department certification as acceptable in lieu of the standard education-department requirements. A science-department faculty is made up of capable, conscientious people who can accept responsibility. After working with a student for several years, they know his capabilities and needs. If he needs the presently required education courses, they will make him take them, but if not, they won’t waste his time, and he will be a better teacher for it. Science faculty members are professional teachers as well as scholars.

Of course Green is right in believing that on intellectual grounds there is enough agreement so that all could work together. But, unfortunately, many educationists lack the sincere constructive attitude which is evident in Green’s letter. Power-hungry, they resist any interference with their present almost complete control of secondary education. I’m afraid the answer lies in political action by a public awakened by Sputnik to the existence of the problem and gradually becoming aware of the causes. Congress amounts to an intellectual Munich. From a position securely entrenched in law the educationists negotiate against the educated community armed with an umbrella.

It is all very well to know where to find props for demonstrations, how to use film libraries, and how to locate audiovisual materials, but the science faculty is a better judge of how much education-department time is necessary for picking up these incidentals than those who lobbied the present rigid and arbitrary requirements onto the statute books years ago or the present-day educationists who resist change of those old-fashioned laws.

I didn’t whitewash the liberal arts departments. If there are places where rescheduling is necessary to meet the needs of the teaching profession, then by all means let’s have rescheduling.

The attempt by Webb to restate my premise as merely a complaint that “a college graduate with a major in science cannot begin to teach at once” indicates inability to refute my argument for repeal of present laws under which that same graduate still cannot teach in the public schools after adding a Ph.D. and ten years of successful teaching in universities or private secondary schools. The new graduate with one more year and enough education-department courses can teach at once—he can get the certification that is denied the superior scholar and experienced professional teacher. Teaching quality is thus downgraded by applicable but obsolete regulations. Laws that create such inequities should be repealed or drastically revised.

William W. Porter II
244 South Gramercy Place,
Los Angeles, California
Meetings

Unusual Conditions in the Pacific

During 1957 and early 1958 it became apparent that the weather, temperatures, and biology of the Pacific were undergoing changes that were quite outside the range of conditions of the last decade or more.

At the invitation of the Scripps Institution of Oceanography, 30 scientists met at Rancho Santa Fe, near San Diego, California, 2–4 June 1958, to consider the nature and causes of the unusual conditions (1).

Participants were from institutions on both coasts of North America and from Hawaii, Japan, and Peru, representing research in the fields of meteorology, oceanography, marine biology, and fishery biology, and included persons actively pursuing their research in the Pacific, from the Bering Sea to Peru and westward through the Central Pacific to Japan.

Data considered were the Northern Hemispheric circulation in the atmosphere, sea temperatures, sea level and currents of the Pacific, and the distribution of marine organisms. In addition, the symposium heard a report on the unusual solar events of 1957, when, in September, sun-spot activity reached a 250-year (all-time record) high. The possible relation to the unusual meteorology was discussed.

Another major departure from conditions in immediately preceding years and from those recorded over long-term periods consisted of the unusually strong development and the southeasterly position of the Aleutian low-pressure systems, especially during the winter of 1957–58; these changes produced markedly anomalous wind fields in middle latitudes of the eastern Pacific directed northeastward, and in the northwest Pacific directed southwestward. This was accompanied by unusually high sea temperatures over much of the eastern Pacific, from the Gulf of Alaska to the coasts of Peru. On the other hand, colder sea temperatures extended southward from the Bering Sea along the coast of Japan. Hawaii, during the summer of 1957, failed to experience the usual lowering of salinity connected with the seasonal oscillations of the subtropic convergence system. Sea levels were anomalously high along the West Coast of North America, by an average of 0.5 foot, with the anomaly appearing earliest and most pronouncedly along the coast of southern California. Drift bottles released 500 miles off the coast of British Columbia at latitude 50°N fetched up on beaches rimming the northern shore of the Gulf of Alaska instead of taking their more usual course eastward toward
British Columbia, Washington, and Oregon. A strongly developed coastal countercurrent along central and northern California, Oregon, and Washington was evidenced by drift bottles released in California waters.

The diatom and dinoflagellate flora monitored at the Scripps Pier at La Jolla, California, included considerable numbers of tropical forms previously rare or absent. Southern forms also were found far north of their expected range in California waters. Certain species of salps ordinarily confined to waters off southern California extended northward in coastal waters well beyond Point Conception, as did also certain euphausiids of similar normal range. Species of these two groups, which normally occupy the oceanic mid-Pacific waters, apparently did not spread eastward towards the North American coasts, however. As for the fishes, there were a number of records from farther north of tropical and subtropical species, and two species, the barracuda and yellowtail, usually caught by sportmen in moderate numbers off southern California, were taken in numbers larger by an order of magnitude than the usual number. Dolphin fish were taken in entirely unprecedented numbers. Sardine spawning, which in the preceding 7-year period had been largely confined to waters off Lower California, in 1957 and 1958 took place in southern California waters. There was an indication that, in 1958, the pelagic phyllosome larvae of the spiny lobster were being better retained in the waters of southern California than in previous years.

The long-term records of such meteorological and oceanographic data as have been recorded systematically suggested that the conditions of 1957 and the winter of 1957–58 represented a marked reversal of conditions which had persisted during the previous decade and resembled roughly the conditions usual during the decade of the 1930’s. The year 1958 appeared, at the time of this writing, to resemble the unusual years of 1926, 1931, and 1941.

Extensive consideration of theoretical models and empirical oceanographic observations led to the conclusion that the phenomena observed during 1957, which reached their peak in the winter of 1957–58, were undoubtedly the evidence of large-scale advection of water masses, but that the theory and the data so far analyzed are inadequate to distinguish the processes by which this advection took place. Particularly in question was the relative influence of transport from the offshore direction as compared with the transport alongshore from the south. The coastal countercurrent (sometimes called the Davidson Current) was more highly developed than in the immediately preceding years, but the mechanisms involved, and the role the coastal countercurrent played in the changed temperature field, remained obscure. Likewise, speculation on a possible displacement of the zonal North Pacific current system failed to produce an entirely satisfactory explanation.

The symposium emphasized the point that local changes of conditions cannot be studied provincially but are part of Pacific-wide or possibly world-wide changes.

The proceedings of the symposium are to be published, and are to be dedicated to Bell Shimada and Townsend Cromwell, whose tragic and untimely deaths in an aircraft accident in Mexico occurred during the symposium.

John D. Isaacs
Scripps Institution of Oceanography,
La Jolla, California

Oscar E. Sette
Fish and Wildlife Service,
U.S. Department of the Interior,
Stanford, California

Note
1. This report is a contribution from the Scripps Institution of Oceanography. It is based on a report to the American Society of Limnology and Oceanography, Logan, Utah, of 18 June 1958.

Forthcoming Events

May

18–22. American Soc. of Tool Engineers, 27th annual, Milwaukee, Wis. (ASTE, 10700 Puritan, Detroit 30, Mich.)
20–22. American Oil Chemists’ Soc., spring, 50th anniversary, New Orleans, La. (Mrs. L. R. Hawkins, 35 E. Wacker Dr., Chicago 1, Ill.)
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20–23. International Anesthesia Research Soc., 33rd cong., Miami Beach, Fla. (A. W. Friend, IARS, E. 107 and Park Lane, Cleveland 6, Ohio.)
21–22. Electronic Data Processing, conf., Cincinnati, Ohio. (C. H. Osterbrock, IRE, Univ. of Cincinnati, Cincinnati, Ohio.)
21–23. German Starch Conv., Detmold, West Germany. (Assoc. of Cereal Research, Detmold, Am Schutzenberg 9, West Germany.)
23–24. Molecular Genetics and Human Disease, symp., Syracuse, N.Y. (L. I. Gardner, Dept. of Pediatrics, State Univ. of New York, College of Medicine, Syracuse 10.)
23–25. Hawaii Medical Assoc., Hilo. (L. McGaquin, 510 S. Beretania St., Honolulu 13.)
24. Illinois State Acad. of Science, 52nd annual, Chicago. (J. S. Ayars, Department of Registration and Education, State Natural History Survey Division, Urbana, Ill.)
24–25. Georgia Acad. of Sciences, Macon. (R. J. Martin, Dept. of Geology, Emory Univ., Atlanta 22, Ga.)
24–25. Louisiana Acad. of Sciences, Ruston. (C. H. Ware, Northwestern State College, Natchitoches, La.)
25. West Virginia Acad. of Sciences, Huntington. (J. D. Draper, Bethany College, Bethany, W.Va.)
25–30. Scientific Apparatus Makers Assoc., 41st annual, White Sulphur Springs, W. Va. (J. Irving, Director of Public Information, SAMA, 20 N. Wacker Drive, Chicago 6, Ill.)
26–29. Industrial Medical Assoc., Chi-
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May

1-3. Prevention of Bacterial Resistance to Antibiotics, intern. symp., Perugia, Italy. (Segreteria del Simposio, Clinica Ostetrica e Ginecologica, Policlinico, Perugia.)

2. Idaho Acad. of Science, Moscow. (E. J. Larson, Sec-Treas., Dept. of Biological Sciences, Univ. of Idaho, Moscow.)


2-7. Experimental Biology, intern. symp. (celebration of Lazzaro Spallanzani), Reggio and Pavia, Italy. (C. Jucci, Director, Istituti di Zoologia L. Spallanzani, Universita-Pavia, Palazzo Botta, Pavia, Italy.)

2-9. International Union for Health Education of the Public, 4th conf., Dussel-

cago, Ill. (L. Arling, 3101 University Ave., SE, Minneapolis 14, Minn.)


27-29. Aero Medical Assoc., Los Angeles, Calif. (T. H. Sutherland, P.O. Box 26, Marion, Ohio.)


22-1. American Inst. of Electrical Engineers, Syracuse, N.Y. (N. S. Hibshman, AIEEE, 33 W. 39th St., New York 18.)

30-1. Eastern States Health Education Conf., New York, N.Y. (I. Galdston, New York Acad. of Medicine, 2 E. 103 St., New York 29.)


30-2. Kansas Acad. of Sciences, Lawrence. (J. O. Harris, Kansas State College, Manhattan.)


30-4. American Assoc. for the Study of Neoplasic Diseases, Gatlinburg, Tenn. (B. H. Siers, Box 268, Gatlinburg.)
3. American Federation for Clinical Research, annual, Atlantic City, N.J. (G. E. Schreiner, Federation University Medical Center, Washington 7.)
3-7. Mechanical Properties of Intermetallic Compounds, Philadelphia, Pa. (J. H. Westbrook, General Electric Research Laboratory, P.O. Box 1086, Schenectady, N.Y.)

4. American Soc. for Clinical Investigation, annual, Atlantic City, N.J. (W. W. Stead, J. Hillis Miller Health Center, Gainesville, Fla.)
4-8. American Soc. of Civil Engineers, Cleveland, Ohio. (W. H. Wiely, 33 West 39th St., New York 1, N.Y.)
5-6. Association of American Physicians, annual, Atlantic City, N.J. (W. W. Stead, vice president, AFRC, J. Hillis Miller Health Center, Gainesville, Fla.)
5-6. Self-Organizing Systems, conf., Chicago, Ill. (S. Cameron, ICROS Conference, 500 W. Madison St., Chicago 60606.)
5-9. Southwestern and Rocky Mountain Div., AAAS, Laramie, Wyo. (M. G. Anderson, New Mexico College of Agriculture and Mining, State College.)
6-8. American Inst. of Chemists, Atlantic City, N.J. (L. Van Doren, American Inst. of Chemists, Inc., 60 E. 42 St., New York 17.)
6-9. National Science Fair, 10th, Hartford Conn. (Science Clubs of America, 1719 N. St., NW, Washington 6.)
6-10. Infectious Pathology, intern. congr., Milan, Italy. (A. Janusis, Secretary General, via Boccaccio 25, Milan.)
7-9. Midwestern Psychological Assoc., Chicago, Ill. (E. Farber, Dept. of Psychology, Univ. of Michigan, Ann Arbor.)
7-9. World Cong. on Agricultural Research, International Confederation of Agricultural Engineers and Technicians, Rome, Italy. (CITA, Regional Secretariat, 86, via Barberini, Rome.)
8-10. Uranium, 4th annual symp., Moab, Utah. (AIME, 29 W. 39 St., New York 18.)
9-11. International Soc. of Acupuncture, 10th congr., Paris, France. (SIA, 8 avenue Franklin Roosevelt, Paris 8.)
10-15. Society of American Bacteriologists, St. Louis, Mo. (E. M. Foster, Univ. of Wisconsin, Madison 6.)
11-13. Power Instrumentation, natl. symp., Kansas City, Mo. (H. Hanson, Consolidated Edison Co. of New York,

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Office of Advanced Research
Theoretical Research—Hydrodynamic and radiation processes in tenuous gases at very high temperatures, ionization produced by soft-X-radiation, hydrometallurgy of solids at high pressures including studies of equations of state, infrared properties of the atmosphere and of the earth, studies in the conversion of chemical energy into sound and the condensation rate of supersaturated vapors. Theoretical physicists are needed to work in these fields. Specific experience is not necessary. However, a general background in theoretical and mathematical physics is required.

You are invited to address inquiries to M. H. Johnson, Advanced Research Staff at our Glendale, California address. Other unusual opportunities are open for qualified engineers and scientists in the following areas:

Space Technology Division
- Navigation
- Materials
- Aerodynamics & Propulsion

Computer Division
Input-Output Equipment
- Storage Units
- Display Devices

Tactical Weapon Systems Division
- Aerodynamics
- Electro-optics
- Guidance and control

Qualified applicants for the above positions are invited to send resumes and inquiries to M. H. Johnson, 5234 Air Way, Bldg. 16, Glendale, California. Phone Chapman 6-6631.

Aeronutronic Systems, Inc.
A subsidiary of Ford Motor Company

Newport Beach, Glendale, Santa Ana and Maywood, Calif.

To-2 ft capacity to 6-in-to-40-ft capacity. Anvils are tipped with tellurite. Swiveling screw joint permits faces to meet squarely. A cover tube on each section provides insulation against temperature changes. (Engis Equipment Co., Dept. 701)

- Angle transducer detects angular changes within 0.25 sec of arc. The output signal of the transducer is suitable for feeding into a servomechanism to correct the change or may be used to actuate a chart recorder. (Keuffel & Esser Co., Dept. 700)

- Boron analyzer operates by detecting B10. The neutron-absorption principle is used. Neutrons are produced by a radium-beryllium wafer and are slowed to thermal velocities by paraffin. The liquid stream to be analyzed passes between the neutron source and a counter tube. Boron concentration is a function of the time required for a preset count to be recorded. Accuracy is ±1 percent by volume. (Mine Safety Appliance Co., Dept. 702)

- Ultracentrifuge attachment permits separation, identification, and characterization of materials at temperatures as high as 120° or as low as 0°C. The attachment consists of a radiation shield and heating element mounted in the rotor chamber, heat-reflecting baffles, and a temperature-indicating and control unit. Rotor temperature can be controlled to within ±0.1°C. The auxiliary can be added to the manufacturer's model E ultracentrifuge without structural changes. (Beckman/Spinco Division, Dept. 704)

- pH electrode assembly is designed for use with samples ranging in size from one drop upward. The reference and measuring electrodes can together be inserted into an opening 0.7 mm in diameter. The flexible electrode support permits the user to squeeze the electrodes together to accommodate a single-drop sample, for example, in the tip of a centrifuge tube. The measuring electrode is self-shielded. Range is 1 to 11.5 pH units with sample temperature range 15° to 40°C. (Leeds and Northrup Co., Dept. 705)

- Millimeter for d-c measurements employs a pen-sized probe that can be clipped around a wire without interrupting the circuit. Measurement ranges from 3 ma to 1 amp are covered in six steps. Accuracy is ±3 percent ±0.1 ma. Direct currents are measured in the presence of alternating current. (Hewlett-Packard Co., Dept. 710)

New Opportunities in Research...

Expanding pharmaceutical company initiating a broadened and accelerated research program offers excellent opportunities in basic research for:

- Senior Research Pharmacologist—Ph.D. with training or interest in cardiovascular research to supervise acute and chronic cardiovascular screening programs and study potential cardiovascular compounds including in vivo and in vitro testing.

- Senior Research Pharmacologist—Ph.D. with general pharmacology training and experience to direct screening program, plan and develop new pharmacologic experiments and new testing methods.

- Parasitologist—B.S. or M.S. with training and/or experience in parasitology and good background in parasitology and helminthology to assist in problems concerning development of compounds in both human and veterinary fields.

- Virology—M.S. with virology or tissue culture training or B.S. with several years virology, immunology or tissue culture experience to assist in problems concerning human and animal virus infection and immunology.

- Bacteriologist—B.S. bacteriology training essential to perform in vitro screening procedures with chemotherapeutic agents.

- Senior Research Biochemist—Ph.D. with strong organic chemistry background to study biochemical transformation of drugs, especially their fate in animal metabolism.

- Biochemist—M.S. with chemistry major, biology minor, to assist in biochemical investigations relating to drug mode of action. Work involves small animal experimentation and analytical biochemistry.

... and medical writing, abstracting:

Scientific Information

Senior Medical Editor—B.S. or advanced degree graduate with training in basic medical sciences and experience in editing, abstracting and writing to edit technical manuscripts, publications and write material for manuscripts and brochures.

- Senior Information Scientist—Ph.D. with training in one or many biological sciences to select and abstract unpublished scientific information, to develop and utilize coding processes in correlation of research data and to conduct liaison among Scientific Staff.

- Translator-Scanner—B.S. with advanced biology, chemistry, medical sciences training and knowledge of several languages to scan current medical and other scientific periodicals and translate scientific information.

Company is located in small, progressive community in semi-rural area of central New York State. Modern laboratories, complete benefit program.

We will welcome your writing to us. Please forward resume to:

Joshua Stern
National Bureau of Standards
Washington, D.C.