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<td>A B C</td>
<td>Cocktail Base</td>
<td>A B C</td>
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*10 ml of base, tritium equal to 2,000 dpm and aqueous phase giving the indicated percentage of the total cocktail combined and counted by a Packard Model 2425 Tri-Carb® Liquid Scintillation Spectrometer. Instrument efficiency for 1H by A.E.S. was 97-99%, representing 58-60% absolute tritium efficiency vs. sealed standards. Data represents averages of four successive 10 minute counts. Efficiencies are expressed as percent of the theoretical decompositions per minute actually counted.

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<tr>
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<tr>
<td>P 20</td>
<td>0 - 20 μl</td>
<td>$98</td>
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<tr>
<td>P 200</td>
<td>20 - 200 μl</td>
<td>$98</td>
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<tr>
<td>P 1000</td>
<td>100 μl - 1 ml</td>
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<tr>
<td>P 5000</td>
<td>0.5 - 5 ml</td>
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operated numerous blimps during World War II and continued research and development afterward. On 26 June 1961, the Navy ordered termination of the blimp program.

Vaeth's statement, "The airship's energy needs are accordingly low," would appear from available evidence to be incorrect. Resistance to forward motion through air is primarily produced by frontal area and airspeed. As a consequence, the great airships were and still are long on frontal area and short on speed.

The Goodyear Tire & Rubber Co. has been building and flying blimps for 48 years (1). They currently operate four. They follow each of these with at least one support truck and one bus to transport 15 or so ground-support crew. I suggest that parties interested in lighter-than-air vehicles as a competitive mode of transportation contact Goodyear before investing much time or money.

What appeared to be a good idea in Count von Zeppelin's day is still not economically feasible.

TED P. BOND
Department of Physiology,
University of Texas Medical Branch,
Galveston 77550

Reference

The Creative Process

Although there are different perceptions of creativity, few are so pessimistic as those reported by Thomas H. Maugh II (Research News, 21 June, p. 1273). I would like to respond to several points.

It is possible "to create conditions that nurture preexisting creativity." Teachers at all levels are daily encouraging inquiry, challenging students to expand their intellectual horizons, and reducing the psychological barriers to both creativity and learning (1).

The ability to generate ideas can be altered. Brainstorming, attribute listing, and other divergent and convergent thinking techniques can be taught so that the individual produces more ideas (2). Further, I have seen hundreds of my own students increase their facility in idea production as a result of instruction, teacher expectancies, and their own growth in self-confidence. On the other hand, while it is possible to teach the principles of critical thinking, it is more difficult to convince people to practice self-criticism. This requires a state of emotional comfort with oneself that can evolve but cannot be taught.

The observation by Krebs that one must know which questions to ask is important. It implies, however, both the psychological freedom to ask questions and some information on which to base them. Differences in ability and experience affect both factors.

In summary, creative ability lies on a continuum. It can be nourished in an atmosphere of psychological freedom or squelched by rigidity. It exists in many realms other than science and the arts and may be apparent in the youthful student as well as the famed adult.

LITA LINZER SCHWARTZ
Department of Educational Psychology,
Pennsylvania State University,
Ogontz Campus, Abington 19001

References and Notes
2. Doubters are referred to G. A. Davis, Psychology of Problem Solving: Theory and Practice (Basic Books, New York, 1973) for a summary of these techniques.

In his report on the conference to dissect the creative process in science and medicine, Maugh notes the participants' conclusions that "the ability to generate ideas is the innate part of creativity that probably cannot be altered," and that "creative science" cannot be taught in universities.

These comments are similar to those of the sculptor Lee Mach in the credo for her Collected Works (1). To the question "How does one assess the myriad influences that finally congeal to create a piece of sculpture, a painting, a song... is art really educable?" she answers, "Many artists, even those that teach, think not. Many creative achievements have been made by men and women with little if any formal education... formal education may tend to smother by the weight of precedent the intuition and initiative of the gifted one. ... Artists no less than doctors, scientists, and educators need the conceptual foundation upon which to build their special expressive skills... education can help or hinder the abilities but cannot produce them."

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Fields of Application

The speed, gentleness and simplicity of molecular filtration have led virologists to apply this new membrane technique to the concentration and purification of animal, plant, and bacterial viruses. For most viruses, both plaque-forming units and intact viral particles are efficiently recovered after molecular filtration.

Using various methods, virologists have concentrated viruses and viral fragments from crude cell lysates as well as from partially purified suspensions. They have removed salts and other low molecular weight contaminants from viral preparations which have been purified on density gradients or stored in high solute buffers. These processes are used increasingly in medical research, studies of viral structure, and in the manufacture of vaccines. Public health scientists are investigating the use of molecular filtration for quantitatively detecting enterovirus contamination in drinking water supplies and in foods.

A Sampling of Results

Purifying Phage Proteins from Density Gradients — In preparation for gel electrophoresis, virologists at the Biology Department, University of California at San Diego, used Millipore molecular filters to concentrate and purify phage component proteins isolated on either sucrose or cesium chloride density gradients. The researchers reduced ionic strength 100-fold while concentrating the proteins by a factor of three. Purifying a 0.3 ml fraction typically took one hour with greater than 90% recovery.

Virus Concentration — Virologists at St. Bartholomew’s Hospital, London, England have used Millipore molecular filters to concentrate picornaviruses, papovaviruses, adenoviruses and influenza and parainfluenza viruses. They report satisfactory concentration with recoveries of virus ranging from 50-100%.

Vaccine Preparation — Millipore molecular filters have been used to separate viral coat proteins from viral DNA during the preparation of adenovirus vaccine. A major pharmaceutical company has concentrated labies vaccine rapidly with no concentration polarization problems and with complete recovery of viral activity. Molecular filtration is also used to remove sucrose from viruses purified by zonal ultracentrifugation.

Virus Purification

Millipore is introducing a new virus purification membrane (PSVP) which retains spherical particles greater than 2,000,000 MW while passing large amounts of smaller macromolecules. Typically in dilute solutions more than 90% of the albumin and 60% of the IgG will pass through the membrane while virus particles are retained. Thus, it can be used to purify virions while concentrating them. PSVP filters are available in a range of sizes for processing samples as small as one milliliter or as large as hundreds of liters per day.

Other Applications

Millipore’s advanced filtering materials and equipment are also used to separate antigen from antibody in radioimmunoassays and have been applied to binding studies, concentration of macromolecules, deproteinizations, and water purification. Other advertisements in this series discuss these applications.

We invite inquiries concerning these or other possible applications, and we extend our filtration technology and professional evaluation services to those interested in developing new or improved techniques. We also offer technical literature, and our technical representatives are available for seminars and training workshops throughout the U.S. and Canada.


Courtesy of JEOL U.S.A., Inc.

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