

between the terms in the chart and those used to characterize the functions of the sides of the human brain—the left side handles logical, serial, analytical processes while the right side controls original, parallel and creative functions. Thus, there appears to be a conflict between the performance of the Japanese people and the implicit characteristics underlying their language.

One is forced to wonder whether there may be a strong dormant creativity there which is currently suppressed by societal patterns, including a rigid educational system. If this is true, perhaps there is a "second shoe" ready to fall upon competitors as the Japanese shed some of their rigid discipline and release their inherent originality.

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4/82

May I add two items to the evidence on the Japanese mind:

- The Japanese predominance at the game of Go, where pattern recognition is required to a highly developed degree
- The failure of the Japanese to crack military codes in World War II (Lieutenant General Seizo Arisue, Chief of Japanese Army Intelligence: "We couldn't crack your codes at all," quoted by David Kahn in *The Code Breakers*, page 328, abridged edition, 1968).

These two points suggest that several aspects of pattern recognition need to be distinguished. A known pattern may be known (or at least suggested) to lie hidden in a mass of confusing detail, and the problem is to extract the pattern. This is perhaps not a creative process, though it can require high logical and computational ability. Call this process "pattern re-recognition."

A second aspect is the recognition of a familiar pattern in situations where previously no such pattern has been noticed. Solving a tough code requires this second process, as does much scientific research.

A third aspect of pattern recognition is deeper. In it a new combination of elements are identified as worth grouping together, and a new mental pattern is created—as distinct from observed—to occur in the physical world. Transformations of science have depended on this kind of process. A description that fitted the observations might be that the Japanese mentality excels in pattern re-recognition rather than pattern recognition or creation.

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5/82

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THE AUTHOR COMMENTS: I very much agree that the game of Go requires a

highly developed degree of pattern recognition. I remember that one of the famous experts of Go once said, "Looking at a certain stage of the game, I recall most of similar patterns which I have ever seen in my old big matches or in historical records, and try to focus on possible best candidates of the next stone. Logical processing for the assessment comes next."

I don't necessarily agree, however, that the *second* and *third* aspects of pattern recognition suggested by Fraser should be distinguished essentially from the first aspect. I know the weakness of Japanese on this aspect, but I think it should rather be attributed to social and cultural differences of our societies. One of the main factors is the "independentness" of people or "individualism." As far as the pattern recognition is concerned, the right hemisphere of the human brain will be playing the major role, regardless of the difference in the "aspects" defined here. Social effect seems to be much more influential.

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5/82

Referees are an audience

Occasionally one reads here about referees and our refereeing systems suggestions that something like challenging to a duel should be worked into the system. The referees are censors, which makes us First-Amendment types hostile. The point I will make and which has occurred to me only recently—perhaps I am slow—is that a subtle effect exists through which the refereeing system enhances publication *quantitatively*. The subtlety follows from the fact that the referee usually *reads your paper*. Now that I knew long ago. My *new* insight is that this reading is itself publication, a transmission of the text's message. I clarify:

The paper, when published, reaches a formal thousand readers or so, because our journals have a small circulation. The majority of these formal recipients do not read it. If requests come back for a hundred copies, that is a lot. Most of these requests are, I think, made by collectors, file-keepers, not people who really *read* the thing. It may be best for us to think that many recipients marvel quietly over it. But I suspect that a goodly portion of the true *readers* argue with you, and that rarely; one debate per paper, perhaps. If the real meaning of publication is conveyance of the new point to another person, then the skirmish with the referee can itself be the primary act of publication. The secondary act will

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letters

very likely be promotion of your paper by the referee. The impersonal reading of the paper by a host of silent readers is a problematical tertiary channel. I am not claiming that you publish *only* to reach the referee. You also do it so that you will yourself be able to look it up at the library, when it gets lost at home.

ELIHU LUBKIN

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4/82

Units of frequency

I wish to support the letters of James Rainwater (September, page 15) and Grote Reber (May, page 122). I have been teaching physics since 1960 and find the units for frequency (a cycle per second or vibration per second) much more useful from the students' point of view since they can easily conceptualize this definition. "Hertz" is just another word and stands in the way of learning. The same can be said for the pressure unit Pascal and the unit for the B-field Tesla. A Newton/m² and Weber/m² are easy to conceptualize. I think we have taken some backward steps from 1960. All I can say about the Hertz is the old Latin idiom "*rara avis*," which means "strange bird."

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6/82

Legality of nuclear freeze

There has been considerable attention lately given to the grassroots movement in support of a mutual freeze on nuclear weapons by the US and the Soviet Union. As a physicist, now working on a state legislative staff, I have no special technical expertise in nuclear arms limitation, although I do support the resolution as a sensible first step toward reducing the danger of cataclysmic nuclear war.

I would, however, like to answer one legal objection that has been raised to the freeze resolution: that it is an inappropriate subject for a local or state government to address. National defense is indeed a constitutional responsibility of the national and not the state or local government.¹ Although this kind of resolution is not a frequently used legislative power, it is a means of communication from the people of the state or town to the Congress and the President, through the elected representatives nearest to us. As such, it is an exercise of the constitutional right of free speech and the fundamental power of the people.^{2,3,4} Our represen-

tatives have a responsibility to represent us as constituents and help get our views heard in Washington. Of course, it is then up to the national government to weigh our messages and decide what to do.

Based on an understanding such as this, the Maine Legislature on 11 March 1982 became the fourth state to endorse a resolution requesting the Congress

... to take immediate action by calling upon both the US and the Soviet Union to adopt a mutual freeze on the testing, production and deployment of nuclear weapons, completely verifiable by whatever methods necessary to ensure compliance by both nations,

Similar resolutions are being introduced in many other states and in the Congress, as the nuclear arms debate continues.

References

1. US Constitution, Article I, Section 8, "The Congress shall have power to... provide for the common defense and welfare of the United States... To declare war... To raise and support armies... To provide and maintain a navy;"

US Constitution, Article I, Section 10

"No State shall enter into any treaty... No State shall, without the consent of Congress, ... keep troops, or ships-of-war, in time of peace, enter into any agreement or compact... with a foreign power..."

US Constitution, Article II, Section 2

"The President, shall be commander-in-chief of the army and navy of the United States..."

2. US Constitution, First Amendment "Congress shall make no law... abridging the freedom of speech, ... or of the right of the people peaceably to assemble, and to petition the government for redress of grievances."
3. Constitution of the State of Maine, Section 4 "Every citizen may freely speak, write and publish his sentiments on any subject."
4. Constitution of the State of Maine, Article I, Section 2: "All power is inherent in the people; all free governments are founded in their authority and instituted for their benefit; they have therefore an unalienable and indefeasible right to institute government, and to alter, reform, or totally change the same, when their safety and happiness require it."

HAVEN WHITESIDE

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4/82

Frustration in physics

The letter by Serge Galam and Pierre Pfeuty (April, page 89) about the word

"frustrated" is surely much too agitated. I know nothing about the recent use of the word in physics, but "frustrate" (and derivatives) has a history of several centuries as a perfectly ordinary English word, meaning to disappoint, thwart, balk, nullify, defeat, counteract, and similar meanings. The Oxford dictionary gives dozens of quotations.

The word even occurs in the second verse of the British national anthem, "God Save the Queen" (a verse seldom sung, for good reason):

... Scatter her enemies
And make them fall,
Confound their politics,
Frustrate their knavish tricks...

Even in physics, "frustrate" is a lot older than Galam and Pfeuty give it credit for. In the phenomenon of total internal reflection at a glass-air interface, you can restore the transmission of light by bringing a second glass surface near to the first, but not touching it. When I was a physics student many years ago, this effect was called "frustrated internal reflection." It seemed a sensible name.

Whether or not "frustrate" is the best choice for its current use in physics, it is a shame to be robbed of a good word simply on pop-Freudian grounds. Some people might call that a knavish trick; I hope it is frustrated.

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5/82

Corrections

January, page 40—In box "Advice to an entrepreneur," line 12, "rungs" should read "rugs."

March, page 64—The editors mistakenly substituted the name of Konrad Lorentz for that of Hendrik Antoon Lorentz in the review of Albert Einstein's Special Theory of Relativity. We are grateful to A. J. Kox (University of Amsterdam) for calling our attention to this error.

April, page 43—Reference 1 should read R. H. Stuewer (instead of H. Steuwer).

May, page 25—Captions were omitted from the photos. The upper photo is a transmission photomicrograph of a liquid-crystal sample between crossed polarizers. The colored areas are birefringent regions of the layered, smectic-A phase nucleating from the isotropic liquid phase as the sample is cooled. (Photo by J. Goodby, Bell Labs.) The lower photo shows a diffraction apparatus from Bell Labs used at the Stanford Synchrotron Radiation Laboratory for structural studies of free-standing liquid-crystal films. (Photo by R. Pindak, Bell Labs.) □