

scribe the intellectual climate and personal circumstances of his early academic career; and several chapters supply biographical and interpretative material on Allport's life and views. At a time when behavioral and psychoanalytic approaches exhausted the list of developed theoretical perspectives, both Allport and Stagner balked at the choice. Stagner chose an integrative resolution, indicating here that he sought to include the clinical insights of psychoanalysis within a behavioristic framework. Allport firmly rejected both schools and helped create a third, humanistic alternative.

While Stagner wrote a good textbook that went through several editions, Allport did more than write a textbook: He provided a definition of the field that is today still widely employed and presented his own theoretical framework for understanding personality. The chapters reviewing the current status of personality textbooks make clear that what Allport achieved is no longer even attempted and what Stagner accomplished is only rarely equaled. Current textbooks typically proffer an uncritical serial presentation of personality theories or perspectives, perhaps devoting several chapters to "representative" but arbitrarily selected content areas. Though the contributors to this volume do not agree on what would constitute the ideal contemporary personality textbook, they all appear dissatisfied with the current form. This dissatisfaction is not hard to understand if Allport's text is the standard for evaluating our present efforts. Allport offered a clearly articulated point of view emphasizing the conscious, purposive, and unique nature of persons, and he assimilated the relevant research literature to this perspective. As a result, Allport's book is a landmark. By comparison, most current texts are little more than tourist guides.

The key to the success of Allport's textbook is in the topics he engaged. In *Fifty Years of Personality Psychology*, the largest set of chapters is devoted to reviewing the current status of those topics that were central in Allport's textbook: understanding the unique individual, motivation and the self, making judgments about personality, and personality assessment. The authors of these chapters take full and deliberate advantage of hindsight. Though each of these chapters could stand alone as a review of a research topic, they collectively provide a fair and demanding test of the personality psychology envisioned by Allport. It is remarkable that the central issues of this 50-year-old textbook provide a framework for understanding so much of the contemporary research literature. Allport was not fully prescient, for there are important areas of current investigation (for example, those concerned with the

biological basis of personality) where he had little to contribute. Contemporary research and theory in the areas emphasized by Allport, including the use of personal documents, the nature of self and identity, motivation, trait structure, judgments of personality, and the prediction of behavior, are each discussed in separate chapters. The wealth of now available data shows that these topics are still central to personality psychology, and Allport's influence on the contemporary scene is unmistakable.

The chapters of *Fifty Years of Personality Psychology* are well written with a minimum of jargon and should be accessible to beginning graduate students, though this audience will lack the preparation to fully appreciate the chapters focusing on substantive issues. But even where this kind of background is lacking the book may compel interest, for it is a book with protagonists whom the reader will come to know and perhaps admire. Those who teach personality psychology will find historical and personal material invaluable for enlivening lectures. This book, moreover, does more than respond to the interests of students of personality and their teachers. Contained here is an implicit but provocative question of interest to an audience much wider than ever anticipated for this volume: What is the role of the textbook in the growth and development of a science?

The absence of a serious effort to engage this question in any of the chapters contributed is the source of my sole quibble with the editors' choice of what to include here. Virtually all of the contributors to this volume agree that Allport's textbook had a profound influence on the subsequent development of personality psychology, and this influence is amply documented in many individual chapters. Why was Allport's book so important? The historical context, the nascent state of the discipline, and Allport's own keen insight that permitted recognition of the key conceptual issues may all be cited as factors. Revolutionary theories, unexpected observations, and methodological innovations are all well-known if not fully understood contributors to the evolution of scientific disciplines. Allport's *Personality: A Psychological Interpretation* shows that a textbook with a point of view can have extensive and perhaps equivalent consequences. For those interested in the growth and development of scientific disciplines, Allport's textbook and its influence on personality psychology present a case to ponder.

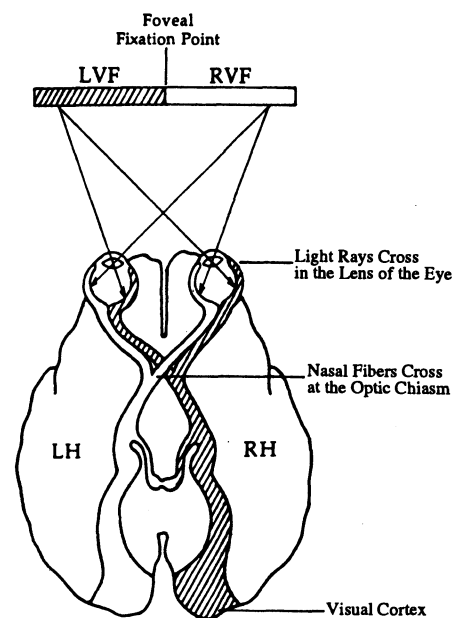
Daniel J. Ozer
Department of Psychology,
University of California,
Riverside, CA 92521-0426

The Unified Brain

Hemispheric Asymmetry. What's Right and What's Left. JOSEPH B. HELDIGE. Harvard University Press, Cambridge, MA, 1993. xvi, 396 pp., illus. \$35 or £27.95. Perspectives in Cognitive Neuroscience.

In the 1960s Nobel laureate Roger Sperry performed pioneering studies of the effects of disconnecting the forebrain commissures in patients with intractable epilepsy. Since then, thousands of papers on cerebral hemispheric asymmetry have been published. The topic has captured the imagination of the general public, as witnessed by the success of popular books on how to access or develop the "other" side of the brain. As a "poor person's neuropsychology," cerebral asymmetry provides a satisfying synthesis of biology and cognition while addressing the most accessible aspect of functional localization.

Hemispheric Asymmetry is the latest in a series of attempts to synthesize a disjointed and contradictory literature. Hellige reminds us that hemispheric specialization is relative and quantitative rather than absolute and qualitative and that how information is processed is more important than the nature (verbal or spatial) of the stimulus. He reviews the concept of metacontrol, which refers to the neural mechanisms that determine the extent to which each hemisphere attempts to assume control of processing, as well as the role of subprocessors.



"The anatomical arrangement of the visual projection system in humans. Note that information from each visual half-field is projected directly to the visual cortex of the contralateral hemisphere." [From *Hemispheric Asymmetry*]



Vignette: Mid-Career Angst

Ken Whitman's field of special competence, after his early interest in echinoid metabolism, was photosynthesis; his doctoral thesis had concerned the 7-carbon sugar sedoheptulose, which occupies a momentary place within the immense chain of reactions whereby the five-sixths of the triosephosphate pool that does not form starch is returned to ribulose-5-phosphate. The process was elegant, and few men under forty were more at home than Ken upon the gigantic ladder, forged by light, that carbon dioxide descends to become carbohydrate. At present he was supervising two graduate students in research concerning the transport of glucose molecules through cell walls. By this point in his career Ken had grown impatient with the molecular politics of sugar and longed to approach the mysterious heart of CO₂ fixation—chlorophyll's transformation of visible light into chemical energy. But here, at this ultimate chamber, the lone reaction that counterbalances the vast expenditures of respiration, that reverses decomposition and death, Ken felt himself barred. Biophysics and electronics were in charge. The grana of stacked quantasomes were structured like the crystal lattices in transistors. Photons excited an electron flow in the cloud of particles present in chlorophyll. Though he had ideas—why chlorophyll? why not any number of equally complex compounds? was the atom of magnesium the clue?—he would have to put himself to school again and, at thirty-two, felt too old. He was wedded to the unglamorous carbon cycle while younger men were achieving fame and opulent grants in such fair fields as neurobiology, virology, and the wonderful new wilderness of nucleic acids. He had a wife, a coming child, a house in need of extensive repair. He had overreached. Life, whose graceful secrets he would have unlocked, pressed upon him clumsily.

—John Updike, in *Couples* (Knopf, 1968; Fawcett paperback)

Directional gradients, to left and right, in the deployment of attention may determine which hemisphere—appropriately or otherwise—strategically manages a task. Whereas the clinical phenomenon of hemineglect (neglect of one side of objects, drawings, and other stimuli) demonstrates the directionality of attentional gradients, with the phenomenon of metacontrol the issue is more one of how than of where attentional control of a task is mediated and deployed, though in neither case do we yet understand the actual mechanisms. It is thought that subprocessors function as individual, dedicated automatic processing systems specialized for different aspects of a given cognitive operation and differentially lateralized to one or the other hemisphere, instead of a single hemisphere managing all aspects of that operation. Observable asymmetries are, then, the result of the interaction of such subprocessors. Both approaches—metacontrol and interacting subprocessors—account well for the effects on performance asymmetries of strategy, experience, and such individual differences as sex, handedness, or genetics. Nevertheless, the two approaches may be mutually exclusive, or at least independent, rather than complementary.

Although Hellige rightly rejects any sin-

gle, simple processing dichotomy to explain hemispheric asymmetry, such as verbal versus spatial or analytic versus holistic, he still flirts with such alternative formulations as local versus global, categorical versus coordinate, and Sergeant's (visual) distinction between high and low spatial frequencies, without fully working out how they interrelate. Nor, in this context, are the different roles of automatic (passive, unconscious, effortless) and controlled (conscious, deliberate, effortful) processing fully elaborated. However, Hellige makes the interesting suggestion of a possible analogy between high and low (visual) *spatial* frequencies and high and low (motor) *temporal* frequencies with respect to operations of the preferred and nonpreferred hands.

In a key chapter Hellige considers interhemispheric cooperation and competition, explaining that the commissures sometimes sharpen processing asymmetries via inhibition and sometimes provide a conduit for information transmission and sharing. The benefits and costs of distributing information processing across both hemispheres have been investigated empirically through reaction-time experiments designed to study the effects of priming and interference. In such experiments a second (related) task is presented concurrently with one

of primary interest, and the effect of the secondary task on performance of the primary task is assessed. Whether the secondary task confers a benefit from priming or imposes a cost from interference depends upon the total information processing demands of the two tasks. If they are low, the primary task may be facilitated because necessary subprocessors have been readied (primed); if they are high, the primary task may suffer through competition (interference) for limited, shared processing resources. It remains unclear, however, how concepts such as these will meld with the concepts of metacontrol and subprocessor interaction.

The book abounds with testable predictions and suggestions for new research, and Hellige usually covers all relevant aspects of an issue. The complexities of current theories are clearly described, usually with due skepticism, though I question Hellige's synthesis of Previc's and others' ideas of maturational cycles such that the more mature right hemisphere is more influenced than the left at a critical early phase of its development by degraded visual information, low spatial frequencies, nonverbal sounds, and coarse sensorimotor feedback, while the left is somehow "saved" for later, higher-quality (verbal) information processing. Moreover, although he gives a good summary of the model presented by MacNeilage *et al.* of the evolution of handedness and includes a chapter on lateralization in nonhuman primates and nonprimates, he does not acknowledge the model's failure to account for such well-documented mammalian asymmetries in the visual, auditory, and cognitive domains. Nor does he mention numerous failures to confirm Geschwind's otherwise attractive theory of a link between handedness, cognitive function, fetal testosterone, and immune dysfunction and the fact that while accounting for weaker male motor asymmetries the theory cannot accommodate opposite effects in the cognitive domain.

Hellige writes very clearly and provides useful and incisive end-of-chapter summaries. Typographical errors are few, as are errors of substance, though *Homo sapiens sapiens* has been around for much longer than 35,000 years, and I'm not sure how choline acetyltransferase is associated with higher levels of dopamine. The references are largely up-to-date and apposite, although the chapters on nonhuman asymmetries and the evolution of language and praxis, while technically competent, rarely go beyond secondary, and sometimes even tertiary, sources.

All in all, *Hemispheric Asymmetry* is an excellent and thought-provoking book that ably captures the excitement of a still-dynamic field. We would all do well to

ponder his observation, at the conclusion of his chapter on interhemispheric interaction, that

to some extent, the emergence during the last thirty years of so much research dealing with the differences between the left and right cerebral hemispheres has resulted in a particular view of the brain: the brain has been "taken apart," and there has been a tendency to analyze and conceptualize the pieces as separate processing systems. Indeed, the same thing could be said about the highly fine-grained modularity that has come to characterize much of cognitive neuroscience. The time has come to put the brain back together again.

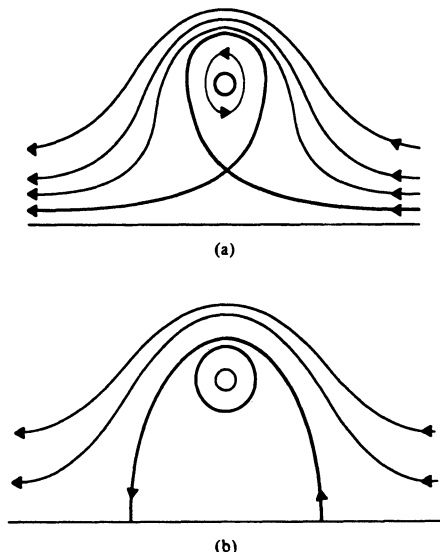
John L. Bradshaw
Psychology Department,
Monash University,
Clayton, Victoria 3168, Australia

Vorticity

Vortex Dynamics. P. G. SAFFMAN. Cambridge University Press, New York, 1992. xii, 311 pp., illus. \$69.95 or £35. Cambridge Monographs on Mechanics and Applied Mathematics.

Vortices are ever present in liquid and gaseous motions, from the eddies seen behind bridge posts in fast-moving streams and rivers (as sketched by Leonardo da Vinci in the 15th century) to the pair of counterspinning white trails behind high-flying jets, which lazily approach each other, twist, and reconnect. Vortices are also found in the ocean and in the atmosphere. For example, the Gulf Stream spins off large gyres, observable from satellites, that may last for months. Storms often bring localized vortices in the form of hurricanes, tornadoes, and typhoons; vortex regions are also present in slowly moving weather patterns that may cause unusual conditions, as in the East Coast heat wave of 1993. Although vortices have been characterized by D. Küchemann as the "sinews and muscles of fluid motions," they are really very fragile and amorphous structures, easily deformed ("stretched," "strained," or "stripped") and topologically modified by interactions with other vorticity-dominated regions and boundaries. Vortex dynamics are strongly nonlinear and most often chaotic; they govern the properties of turbulence and the associated phenomena of heat and pollutant transport.

Philip Saffman, continuing in the tradition of Lord Kelvin, Lord Rayleigh, and G. I. Taylor, is a pioneering contributor to the field of physical and mathematical vortex statics and dynamics. Drawing mainly from his own previous work as well as that of D. Moore, D. Pullin, and their students and colleagues, he



"Sketch of relative streamlines for (a) thin and (b) fat vortex rings." [From *Vortex Dynamics*]

has now attempted to update chapter 7 of H. Lamb's classic 1932 monograph *Hydrodynamics*. The contents of *Vortex Dynamics* fall into three basic categories: general considerations, theory and applications of two-dimensional problems, and theory and applications of three-dimensional problems. Heuristic derivations are followed by careful calculations using energy principles and, often, linear stability analyses. Saffman has an admirable talent for rendering the content of formulas into physical insights, and he keeps mathematical formalism and theorems to a minimum. Although he presents a few illustrations to illuminate the textual description and several simple graphs that show the consequences of linear analyses, results of laboratory experiment or numerical simulations unfortunately are mentioned only in passing.

Saffman includes good discussions of impulse, energy, helicity, and virtual momentum. In the two-dimensional realm he deals mostly with the Euler equations, as represented by singular vortex points and sheets as well as contours, which bound piecewise, constant vortex regions. In the three-dimensional realm he discusses the formation, core structure, stability, and properties of the vortex ring, a commonplace torus-like structure (as in the ring blown by a smoker). In a chapter on the dynamics of vortex filaments he discusses the regularization of motion due to the core cutoff approximation and provides a clear and concise review of the linear stability of vortex columns. The motions described are typically applicable to steady and near-steady (laminar) or short-time unstable solutions.

In my opinion, Saffman does not place sufficient emphasis on longer-time nonlinear evolutions of nonsingular vortex distributions. For example, in his final chapter

MILLIPORE
ELECTROPHORESIS

Pre-cast gels with better performance...

Using pre-cast SDS-PAGE gels to save time isn't really a bargain if you trade performance for convenience. But you can have both with Millipore pre-cast mini gels. Our Tris-tricine chemistry produces better protein fractionation of all molecular weights, especially low MW proteins.¹

And, to make sure you get the best results, we include the Tris-tricine running buffer and sample buffer concentrate with every pack of pre-cast gels.

...and longer shelf life.

Because of our expertise in casting, we have a proprietary manufacturing process that overcomes the inherent instability in pre-cast gels. Our tricine chemistry's shelf life far exceeds the usual 90 days associated with conventional Laemmli chemistry.

Let us prove it to you for free!

Try a free two-pack of the pre-cast gel of your choice:

Gradient: 4-20% or 10-20%

Homogeneous: 7.5%, 10%, 12%, 16%, or 20%

Includes running and sample buffers. Other configurations are available upon request. But call soon.

This offer expires December 31, 1993. Call 1-800-MILLIPORE or our fax on demand information retrieval system at 1-800-MILLIFX and request #1700.

MILLIPORE

¹Anal. Biochem. 179: 37-49