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A NEUROLOGIST'S NOTEBOOK

FACE-BLIND

Why are some of us terrible at recognizing faces?

BY OLIVER SACKS



It is with our faces that we face the world, from the moment of birth to the moment of death. Our age and our gender are printed on our faces. Our emotions, the open and instinctive emotions that Darwin wrote about, as well as the hidden or repressed ones that Freud wrote about, are displayed on our faces, along with our thoughts and intentions. Though we may admire arms and legs, breasts and buttocks, it is the face, first and last, that is judged "beautiful" in an aesthetic sense, "fine" or "distinguished" in a moral or intellectual sense. And, crucially, it is by our faces that we can be

recognized as individuals. Our faces bear the stamp of our experiences and our character; at forty, it is said, a man has the face he deserves.

At two and a half months, babies respond to smiling faces by smiling back. "As the child smiles," Everett Ellinwood writes, "it usually engages the adult human to interact with him—to smile, to talk, to hold—in other words, to initiate the processes of socialization. . . . The reciprocal understanding mother-child relationship is possible only because of the continual dialogue between faces." The face, psycho-

Mild cases can seem comical, but severe prosopagnosia afflicts millions in the U.S.

analysts consider, is the first object to acquire visual meaning and significance. But are faces in a special category as far as the nervous system is concerned?

I have had difficulty recognizing faces for as long as I can remember. I did not think too much about this as a child, but by the time I was a teen-ager, in a new school, it was often a cause of embarrassment. My frequent inability to recognize schoolmates would cause bewilderment, and sometimes offense—it did not occur to them (why should it?) that I had a perceptual problem. I usually recognized close friends without much difficulty, especially my two best friends, Eric Korn and Jonathan Miller. But this was partly because I identified particular features: Eric had heavy eyebrows and thick spectacles, and Jonathan was tall and gangly, with a mop of red hair. Jonathan was a keen observer of postures, gestures, and facial expressions, and seemingly never forgot a face. A decade later, when we were looking at old school photographs, he still recognized literally hundreds of our schoolmates, while I could not identify a single one.

It was not just faces. When I went for a walk or a bicycle ride, I would have to follow exactly the same route, knowing that if I deviated even slightly I would be instantly and hopelessly lost. I wanted to be adventurous, to go to exotic places—but I could do this only if I bicycled with a friend.

At the age of seventy-seven, despite a lifetime of trying to compensate, I have no less trouble with faces and places. I am particularly thrown if I see people out of context, even if I have been with them five minutes before. This happened one morning just after an appointment with my psychiatrist. (I had been seeing him twice weekly for several years at this point.) A few minutes after I left his office, I encountered a soberly dressed man who greeted me in the lobby of the building. I was puzzled as to why this stranger seemed to know me, until the doorman greeted him by name—it was, of course, my analyst. (This failure to recognize him came up as a topic in our next session; I think that he did not entirely believe me when I maintained that it had a neurological basis rather than a psychiatric one.)

A few months later, my nephew

Jonathan Sacks came for a visit. We went for a walk—I lived in Mount Vernon, New York, at the time—and it started raining. "We had better get back," Jonathan said, but I couldn't find my house or my street. After two hours of walking around, during which we both got thoroughly soaked, I heard a shout. It was my landlord; he said that he had seen me pass the house three or four times, apparently failing to recognize it.

In those years, I had to take the Boston Post Road to get from Mount Vernon to the hospital where I worked, on Allerton Avenue in the Bronx. Though I took the same route twice a day for eight years, the road never became familiar to me. I never recognized the buildings on either side, and I often took the wrong turn, realizing it only when I came to one of two landmarks that were unmistakable, even for me: at one end, Allerton Avenue, which had a large sign, or the Bronx River Parkway, which loomed over the Boston Road.

I had been working with my assistant, Kate, for about six years when we arranged to rendezvous in a midtown office for a meeting with my publisher. I arrived and introduced myself to the receptionist, but failed to note that Kate had already arrived and was sitting in the waiting area. That is, I saw a young woman there but did not realize that it was her. After about five minutes, smiling, she said, "Hello, Oliver. I was wondering how long it would take you to recognize me."

Parties, even my own birthday parties, are a challenge. (More than once, Kate has asked my guests to wear name tags.) I have been accused of "abstruse-mindedness," and no doubt this is true. But I think that a significant part of what is variously called my "shyness," my "reclusiveness," my "social ineptitude," my "eccentricity," even my "Asperger's syndrome," is a consequence and a misinterpretation of my difficulty recognizing faces.

My problem with recognizing faces extends not only to my nearest and dearest but also to myself. Thus, on several occasions I have apologized for almost bumping into a large bearded man, only to realize that the large bearded man was myself in a mirror. The opposite situation once occurred at a restaurant. Sitting

at a sidewalk table, I turned toward the restaurant window and began grooming my beard, as I often do. I then realized that what I had taken to be my reflection was not grooming himself but looking at me oddly.

In 1988, I met Franco Magnani, the "memory artist," and during the next couple of years I spent weeks with him, talking about his paintings, his life, and even travelling to Italy with him to visit the village where he grew up. When I finally submitted an article about him to *The New Yorker*, Robert Gottlieb, who was then the magazine's editor-in-chief, read the piece and said, "Very nice, fascinating—but what does he look like? Can you add some description?" I parried this awkward (and, to me, unanswerable) question by saying, "Who cares what he looks like? The piece is about his work."

"Our readers will want to know," Bob said. "They need to picture him."

"I will have to ask Kate," I said. Bob gave me a peculiar look.

I assumed that I was just very bad at recognizing faces, as my friend Jonathan was very good at it—that this was within the limits of normal variation, and that he and I just stood at opposite ends of a spectrum. It was only when I went to Australia to visit my older brother Marcus, whom I had scarcely seen in thirty-five years, and discovered that he, too, had exactly the same difficulties recognizing faces and places, that it dawned on me that this was something beyond normal variation, that we both had a specific trait, a so-called prosopagnosia, probably with a distinctive genetic basis.

(Our other two brothers seemed to have normal powers of facial recognition. My father, a general practitioner, was immensely gregarious and seemed to know hundreds of people, not to mention the thousands of patients in his practice. My mother, in contrast, seemed almost pathologically shy. She had a small circle of intimates—family members and colleagues—and was very ill at ease in large gatherings. I cannot help wondering, in retrospect, if some of her "shyness" was due to a mild prosopagnosia.)

That there were others like me was brought home in various ways. The meeting of two people with prosopagnosia, in particular, can be very challenging. A few years ago, I wrote to one

of my colleagues to tell him that I admired his new book. His assistant then phoned Kate to arrange a dinner, and they settled on a weekend meeting at a restaurant in my neighborhood.

"There may be a problem," Kate said. "Dr. Sacks cannot recognize anyone."

"It's the same with Dr. W.," his assistant replied.

"And another thing," Kate added. "Dr. Sacks cannot find restaurants or other places; he gets lost very easily—he can't even recognize his own building sometimes."

"Yes, it's the same with Dr. W.," his assistant said.

Somehow, we did manage to meet, and enjoyed dinner together. But I have no idea what Dr. W. looks like, and he probably wouldn't recognize me, either.

Although such examples may seem comical, they are sometimes quite devastating. A person with very severe prosopagnosia may be unable to recognize his spouse, or to pick out his own child in a group of people.

Jane Goodall also has a certain degree of prosopagnosia. Her problems extend to recognizing chimpanzees as well as people—thus, she says, she is often unable to distinguish individual chimps by their faces. Once she knows a particular chimp well, she ceases to have difficulties; similarly, she has no problem with family and friends. But, she says, "I have huge problems with people with 'average' faces. . . . I have to search for a mole or something. I find it very embarrassing! I

can be all day with someone and not know them the next day."

She added that she, too, has difficulty recognizing places: "I just don't know where I am until I am very familiar with the route. I have to turn and look at landmarks so I can find my way back. This was a problem in the forest, and I often got lost."

In 1985, I published a case history I called "The Man Who Mistook His Wife for a Hat," about Dr. P., who had a very severe visual agnosia. He was not able to recognize faces or their expressions. Moreover, he could not identify, or even categorize, objects; thus, he was unable to recognize a glove, to distinguish it as an article of clothing, or to perceive that it resembled a hand.

After Dr. P.'s story was published, I began to get letters from correspondents who would compare their difficulties in recognizing places and faces with his. In 1991, Anne F. wrote to me, describing her experience:

I believe that three people in my immediate family have visual agnosia: my father, a sister, and myself. We each have trains in common with your Dr. P., but, hopefully, not to the same degree. The most striking behavior we all share in common with Dr. P. is the prosopagnosia. My father, a man who has had a successful radio career here in Canada (his particular gift is an ability to mimic voices), was unable to recognize his wife . . . in a recent photograph. At a wedding reception, he asked a stranger to identify the man sitting next to his daughter (my husband of five years at the time).

I have walked past my husband, while

staring directly at his face, on several occasions without recognizing him. I have no difficulty recognizing him, however, in situations or places where I am expecting to see him. I am also able to recognize people immediately when they begin to speak, even if I've heard their voice only once in the past.

Unlike Dr. P., I feel I can read people well on an emotional level. . . . I don't have the degree of agnosia for common objects that Dr. P. had. (However), like Dr. P., I am totally incapable of establishing a topographical representation of space. . . . I have no memory for where I put things unless I verbally encode the location. Once an object leaves my hands, it drops off the edge of the world into a void.

While Anne F. seems to have prosopagnosia and topographical agnosia on a genetic or familial basis, others may develop this (or any other form of agnosia) in consequence of a stroke, a tumor, an infection, or an injury—or, like Dr. P., a degenerative disease such as Alzheimer's—that has damaged a particular part of the brain. Joan C., another correspondent, had an unusual history in this regard: she had developed a brain tumor in the right occipital lobe, and this was removed when she was fourteen. It seems likely, though it is difficult to be certain, that her prosopagnosia was the result of the tumor or the surgery. Her inability to recognize faces has often been misinterpreted by others: "I've been told that I'm rude, or a space cadet, or (according to a psychiatrist) suffering from a psychiatric disorder."

As I continued to receive more and more letters from people with prosopagnosia or topographical agnosia, it became clear to me that "my" visual problem was not uncommon and must affect many people around the world.

Face recognition is crucially important for humans, and the vast majority of us are able to identify thousands of faces individually, or to easily pick out familiar faces in a crowd. A special expertise is needed to make such distinctions, and this expertise is nearly universal, not only in humans but in other primates. How, then, do people with prosopagnosia manage?

In the past few decades, we have become very conscious of the brain's plasticity—how one part or system of the brain may take over the functions of a defective or damaged one. But this does not seem to occur with prosopagnosia or topographical agnosia—they are usually



lifelong conditions that do not lessen as one grows older. People with prosopagnosia, therefore, need to be resourceful and inventive in finding strategies for circumventing their deficits: recognizing people by an unusual nose or beard, for example, or by their spectacles or a certain type of clothing.

Many prosopagnosics recognize people by voice, posture, or gait; and, of course, context and expectation are paramount—one expects to see one's students at school, one's colleagues at the office, and so on. Such strategies, both conscious and unconscious, become so automatic that people with moderate prosopagnosia can remain unaware of how poor their facial recognition actually is, and are startled if it is revealed to them by testing (for example, with photographs that omit ancillary clues like hair or eyeglasses).

The artist Chuck Close, who is famous for his gigantic portraits of faces, has severe, lifelong prosopagnosia. He believes it has played a crucial role in driving his unique artistic vision. "I don't know who anyone is and essentially have no memory at all for people in real space," he says. "But when I flatten them out in a photograph I can commit that image to memory."

Perhaps this "flattening" allows him to memorize certain features. Although I myself may be unable to recognize a particular face, I can recognize various things about a face: that there is a large nose, a pointed chin, tufted eyebrows, or protruding ears. Such features become the identifying markers by which I recognize people. (I think that, for similar reasons, I find it easier to recognize a caricature than a straightforward portrait or a photograph.) I am reasonably good at judging age and gender, though I have made a few embarrassing blunders. I am far better at recognizing people by the way they move, their "motor style." And, even if I cannot recognize particular faces, I am sensitive to the beauty of faces, and to their expressions.

I avoid conferences, parties, and large gatherings as much as I can, knowing that they will lead to anxiety and embarrassing situations, since I not only fail to recognize people that I know well but tend also to greet strangers as old friends. (Like many prosopagnosics, I avoid greeting people by name, lest I use the

wrong one, and I depend on others to save me from egregious social blunders.)

I am much better at recognizing my neighbors' dogs (they have characteristic shapes and colors) than my neighbors themselves. Thus, when I see a youngish woman with a Rhodesian Ridgeback hound I realize that she lives in the apartment next to mine. If I see an older lady with a friendly golden retriever, I know that this is someone from down the block. But if I should pass either woman on the street without her dog she might as well be a complete stranger.

The idea that "the mind," an immaterial, airy thing, could be embodied in a lump of flesh—the brain—was intolerable to seventeenth-century religious thinking; hence the dualism of Descartes and others. But physicians, observing the effects of strokes and other brain injuries, had long had reason to suspect that the functions of the mind and the brain were linked. Toward the end of the eighteenth century, the anatomist Franz Joseph Gall proposed that all mental functions must arise from the brain—not from the "soul," as many people imagined, or from the heart or the liver. Instead, he envisioned within the brain a collection of twenty-seven "organs," each responsible for a different moral or mental faculty. Such faculties, for Gall, included what we now call perceptual functions, such as the sensation of color or sound; cognitive faculties, like memory; mechanical aptitude, and speech and language; and even "moral" traits, such as friendship, benevolence, and pride. (For these heretical ideas, he was exiled from Vienna and would eventually end up in revolutionary France, where he hoped a more scientific approach might be embraced.)

The physiologist Marie Jean Pierre Flourens decided to investigate Gall's theory by removing slices of the brain in living animals, chiefly pigeons. But he could not find any evidence to correlate specific areas of the cortex with specific faculties (perhaps because one needs very delicate and discrete ablations in order to do so, especially in the tiny pigeon cortex). The cortex, he concluded, was equipotential, as homogeneous and undifferentiated as the liver. "The brain," it is said, "secretes thought as the liver secretes bile."

Flourens's notion of an equipotential

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cortex dominated thought until the studies of Paul Broca, in the eighteen-sixties. Broca performed autopsies on many patients with expressive aphasia, all of whom, he showed, had damage that was limited to the frontal lobes on the left side. In 1865, he was able to say, famously, "We speak with the left hemisphere," and the notion of a homogeneous and undifferentiated brain, it seemed, was laid to rest. Broca felt that he had located a "motor center for words" in a particular part of the left frontal lobe (an area that we now call Broca's area).

This seemed to promise a new sort of localization, a genuine correlation of neurological and cognitive functions with specific centers in the brain. Neurology moved confidently ahead, identifying "centers" of every sort: Broca's motor center for words was followed by Wernicke's auditory center for words, and Déjerine's visual center for words—all in the left hemisphere, the language hemisphere—and a center for visual recognition in the right hemisphere.

But, while visual agnosia of a general sort was recognized in the eighteen-nineties, there was little notion that there could be agnosia for particular visual categories, such as faces or places, until 1947, when Joachim Bodamer, a German neurologist, described three patients who were unable to recognize faces but had no other difficulties with recognition. It seemed to Bodamer that this highly selective form of agnosia needed a special name—it was he who coined the term "prosopagnosia"—and that such a specific loss must imply that there was a discrete area in the brain specialized for face recognition. This has been a matter of dispute ever since: is there a system dedicated only to face recognition, or is face recognition simply one function of a more general visual-recognition system? A 1955 paper by the English neurologist Christopher Pallas, with beautiful detail and documentation, brought the issue to the fore.

Pallas's patient, A.H., was a mining engineer at a Welsh colliery who had kept a journal and was able to give Pallas an articulate and insightful description of his experiences. One night in June of 1953, A.H. apparently suffered a stroke. He "suddenly felt unwell after a couple of drinks at his club." He appeared to be confused and was taken home to bed,

where he slept poorly. Getting up the following morning, he found his visual world completely transformed, as he reported to Pallas:

I got out of my bed. My mind was clear but I could not recognize the bedroom. I went to the toilet. I had difficulty in finding my way and recognizing the place. Turning round to go back to bed I found I couldn't recognize the room, which was a strange place to me.

I could not see colors, only being able to distinguish light objects from dark ones. Then I found out all faces were alike. I couldn't tell the difference between my wife and my daughter. Later I had to wait for my wife or mother to speak before recognizing them. My mother is 80 years old.

I can see the eyes, nose, and mouth quite clearly but they just don't add up. They all seem chalked in, like on a blackboard.

Since Pallas's time, a number of patients with prosopagnosia have come to autopsy. Here the data are clear: virtually all patients with prosopagnosia, irrespective of the cause, have lesions in the right visual-association cortex, in particular on the underside of the occipitotemporal cortex. There is nearly always damage in a structure called the fusiform gyrus, and these autopsy results gained additional support in the nineteen-eighties, when it became possible to visualize the brain of living patients by CT scanning and MRI—here, too, prosopagnosic patients showed lesions in what came to be called the "fusiform face area."

In the nineteen-nineties, such lesion studies were complemented by functional imaging—visualizing the brains of people with fMRI as they looked at pictures of faces, places, and objects. These functional studies demonstrated that looking at faces activated the fusiform face area much more strongly than looking at other test images did.

That individual neurons in this area could show preferences was first demonstrated in 1969 by Charles Gross, using electrodes in the inferotemporal cortex of macaques. Gross found cells that responded dramatically to the sight of a monkey's paw—but also, less strongly, to a variety of other stimuli, including a human hand. Subsequently, he found cells that had a relative preference for faces.

Much that we now take for granted in neuroscience was very unclear when Gross began this work. Even in the late nineteen-sixties, it was widely believed that the visual cortex did not extend far

beyond its main locus in the occipital lobes (as we now know it does). That the representation and recognition of specific categories of objects—faces, hands, etc.—might rely on individual neurons or clusters of neurons was considered improbable, even absurd; the idea was good-humoredly mocked by Jerome Lettvin in his famous comments about “grandmother cells.” Very little attention, therefore, was paid to Gross’s early findings, and it was not until the nineteen-eighties that they were confirmed and amplified by other researchers.

In humans, some ability to recognize faces is present at birth or soon after. By six months, as Olivier Pascalis et al. have shown in one study, babies are able to recognize a broad variety of individual faces, including those of another species (in this study, pictures of monkeys were used). By nine months, though, the babies had become less adept at recognizing the monkey faces unless they had received continuing exposure to them. As early as three months, infants are learning to narrow their model of “faces” to those they are frequently exposed to. The implications of this work for humans are profound. To a Chinese baby brought up in his own ethnic environment, Caucasian faces may all, relatively speaking, “look the same,” and vice versa. One prosopagnosic acquaintance, born and raised in China, went to Oxford as a student and has lived in the United States for decades. Nonetheless, he tells me, “European faces are the most difficult—they all look the same to me.” It seems that there is an innate and presumably genetically determined ability to recognize faces, and this capacity gets focused in the first year or two, so that we become especially good at recognizing the sorts of faces we are likely to encounter. Our “face cells,” already present at birth, need experience in order to develop fully.

The fact that many (though not all) people with prosopagnosia also have difficulty recognizing places has suggested to some researchers that face and place recognition are mediated by distinct but adjacent areas. Others believe that both faculties are mediated by a single zone that is perhaps oriented more toward faces at one end and toward places at the other.

The neuropsychologist Elkhonon

Goldberg, however, questions the whole notion of discrete, hardwired centers, or modules, with fixed functions in the cerebral cortex. He feels that at higher cortical levels there may be much more in the way of gradients, where areas whose function is developed by experience and training overlap or grade into one another. In his book “The New Executive Brain,” Goldberg speculates that a gradational principle constitutes an evolutionary alternative to a modular one, permitting a degree of flexibility and plasticity that would be impossible for a brain that is organized in a purely modular fashion.

While modularity, he argues, may be characteristic of the thalamus—an assemblage of nuclei with fixed functions, fixed inputs and outputs—a gradational organization is more characteristic of the cerebral cortex, and becomes more and more prominent as one ascends from primary sensory cortex to association cortex and, finally, to the highest level of all: the frontal cortex. Modularity and gradients may thus coexist, and complement one another.

Some researchers have proposed that prosopagnosia is not purely a problem with face blindness but one aspect of a more general difficulty in distinguishing the individuals in any class, whether that class consists of faces, cars, birds, or anything else.

Isabel Gauthier and her colleagues tested a group of car experts and a group of expert birders, comparing them with a group of normal subjects. The fusiform face area, they found, was activated when all the groups looked at pictures of faces. But it was also activated in the car experts when they were asked to identify particular cars, and in the birders when they were asked to identify particular birds. The fusiform face area is tuned primarily for facial recognition, it seems, but some of it can be trained to distinguish individual items of other sorts. (If, then, an expert bird spotter or car buff is unlucky enough to acquire prosopagnosia, he will also, we might suspect, lose his ability to identify birds or cars.)

The fusiform face area does not work in isolation; it is a vital node in a cognitive network that stretches from the oc-

cipital cortex to the prefrontal area. Face blindness may occur even with an intact fusiform face area, if the lower occipital face areas have been damaged. And people with moderate prosopagnosia, like Jane Goodall or me, can, after repeated exposure, learn to identify those they know best. Perhaps this is because we are using slightly different pathways to do so, or perhaps, with training, we can make better use of our relatively weak fusiform face areas.



Above all, the recognition of faces depends not only on the ability to parse the visual aspects of a face—its particular features and their over-all configuration—and compare them with others but also on the

ability to summon the memories, experiences, and feelings associated with that face. The recognition of specific places or faces, as Pallas emphasized, goes with a particular feeling, a sense of association and meaning. While purely visual recognition of faces is mediated by the fusiform face area and its connections, emotional familiarity is probably mediated at a higher, multimodal level, where there are intimate connections with the hippocampus and the amygdala, areas that are involved in memory and emotion. Thus A.H., after his stroke, lost not only his ability to identify faces but also this sense of familiarity; every face and place appeared new to him, and continued to do so even if seen again and again.

Recognition is based on knowledge and familiarity is based on feeling, but neither entails the other. The two have different neural bases and can be dissociated; thus, although both are lost in tandem with prosopagnosia, one can have familiarity without recognition or recognition without familiarity in other conditions. The former occurs in instances of *déjà vu* and also in the “hyperfamiliarity” for faces described by Devinsky. Here a patient may find that everyone on the bus, or in the street, looks “familiar”—he may go up to them and address them as old friends, even while realizing that he cannot possibly know them all. My father was always very sociable and could recognize hundreds or even thousands of people, but his feeling of “knowing” people became exaggerated, and perhaps

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pathological, as he moved into his nineties. He often attended concerts at Wigmore Hall, in London, and there, during the intermission, he would accost everyone in sight, saying, "Don't I know you?"

The opposite occurs in people with Capgras syndrome, for whom faces, though recognized, no longer generate a sense of emotional familiarity. Since a husband or wife or child does not convey that special warm feeling of familiarity, the Capgras patient will argue, they cannot be the real thing—they *must* be clever impostors, counterfeits. People with prosopagnosia have insight; they realize that their problems with recognition come from their own brains. People with Capgras syndrome, in contrast, remain immovable in their conviction that they are perfectly normal and it is the other person who is profoundly, even uncannily, wrong.

Individuals with acquired prosopagnosia, like A.H. or Dr. P., are relatively rare—most neurologists are likely to encounter such a patient once or twice in their career, if at all. Congenital prosopagnosia (or, as it is sometimes called, "developmental" prosopagnosia), such as I have, is much more common, yet it remains completely unrecognized by most neurologists. This is not entirely surprising, for people with congenital prosopagnosia do not generally consult neurologists about their "problem." It is just the way they are.

Ken Nakayama, at Harvard, who investigates visual perception, has long suspected that prosopagnosia is relatively common but underreported. In 2001, he and his colleague Brad Duchaine, at University College, London, began seeking subjects with face blindness through their Web site, and they received an impressive response. Nakayama and Duchaine are now investigating several thousand people with lifelong prosopagnosia, ranging from mild to cripplingly severe.

While congenital prosopagnosics do not have gross lesions in the brain, a recent study by Garrido et al. showed that they do have subtle but distinct changes in the brain's face-recognition areas. The condition also tends to be familial: Duchaine, Nakayama, and their colleagues have described one family in which ten members—both parents and seven of their eight children (the eighth could not

be tested), as well as a maternal uncle, have it. Clearly, there are strong genetic determinants at work here.

Nakayama and Duchaine have explored the neural basis of face and place recognition, generating new knowledge and insights at every level from the genetic to the cortical. They have also studied the psychological effects and social consequences of developmental prosopagnosia and topographical agnosia—the special problems these conditions can create for an individual in a complex social and urban culture.

And the range seems to extend in a positive direction, too. Russell, Duchaine, and Nakayama have described "super-recognizers," people with extraordinarily good face-recognition abilities, including some who seem to have indelible memories of virtually every face they have ever seen. Alexandra L., one of my correspondents, described her own uncanny ability to recognize people:

It happened again yesterday. I was on my way down into the subway in Soho when I identified someone fifteen feet ahead of me (back turned, talking intently with his friend) as a man I knew, or had seen before. In this case, it was Mac, who used to be a family friend's art dealer. I had last seen him (briefly) two years earlier, at an opening in midtown. I'm not sure I've ever spoken with him beyond an introduction a good ten years ago.

This is an integral part of my life—I catch a passing glimpse of someone and, with no real effort, *flash*, place the face—yes, that's the girl who served us wine at an East Village bar last year (again, in a totally different neighborhood, and at night not during the day). It is true that I'm a big fan of people, of humanity and diversity . . . but to my knowledge I make no effort to record the physical traits of ice-cream servers, shoe salesmen and friends of friends of friends. Even a slant wedge of face, or the way someone walks two blocks away at dusk, can trigger my mind to zero in on a match.

The super-recognizers, Russell et al. write, "are about as good at face recognition and perception as [lifelong] prosopagnosics are bad"—that is, about two or three standard deviations above average, while the most severe prosopagnosics have face-recognizing abilities two or three standard deviations below average. Thus, the difference between the best face recognizers and the worst among us is comparable to that between people with an I.Q. of 150 and those with an I.Q. of 50. As with any bell curve, the vast majority are somewhere in the middle.

Severe congenital prosopagnosia is

MEN AT WORK

I said, "Do you speak my language?"
He just smiled and gave me a Vegemite sandwich.
—*"Down Under,"*

We middle-aged sense them immediately: four brittle pop stars sprawled across the rigid fiberglass chairs at the airport gate. It's not just that they're Australian, that gorgonian thunk of English, the stacked electric-guitar cases draped with black leather jackets, or their deep tans on this Sunday night in midwinter Toronto that holds everyone's attention, *drawn* as we are, pale filings to their pull. Even their rail-thin lassitude attracts us, as it must Doug, the portly Air Canada gate manager in his personalized jacket, who arrives to greet the band, cranking hands and cracking jokes. Doug, who must live in Mississauga with the wife and a couple of kids, and who insists the boys come back to play Toronto next year, when we clutched our boarding passes will have abandoned our carry-ons for tickets to a midized arena and a resurrected band whose lyrics never did make sense but which are laced to a beat that won't let go—propelling us down the carpeted ramps of late-night flights on feeder airlines, hips back in charge of our strange young bodies, now shaking down runways in rows.

—Julie Bruck

estimated to affect two to two and a half per cent of the population—six to eight million people in the United States alone. (A much higher percentage, perhaps ten per cent, are markedly below average in face identification, but not cripplingly face-blind.) For these people, who have difficulty recognizing their husbands, wives, children, teachers, and colleagues, there is still no official recognition or public understanding.

This is in marked contrast to the situation with another neurological minority, the ten per cent or so of the population with dyslexia. Teachers and others are increasingly aware of the special difficulties, and often the special gifts, that dyslexic children may have, and are beginning to provide educational strategies and resources for them.

But, for now, people with varying degrees of face blindness must rely on their own ingenuity, starting with educating

others about their unusual, but not rare, condition. Increasingly, prosopagnosia is also the subject of books, Web sites, and support groups, where people with face blindness or topographical agnosia are able to share experiences and, no less important, strategies for recognizing faces and places when the usual "automatic" mechanisms have been compromised.

Ken Nakayama, who is doing so much to promote the scientific understanding of prosopagnosia, also has a personal acquaintance with the subject, and posts this notice in his office and on his Web site (faceblind.org):

Recent eye problems and mild prosopagnosia have made it harder for me to recognize people I should know. Please help by giving your name if we meet. Many thanks. ♦

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Oliver Sacks talks about his face blindness.

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