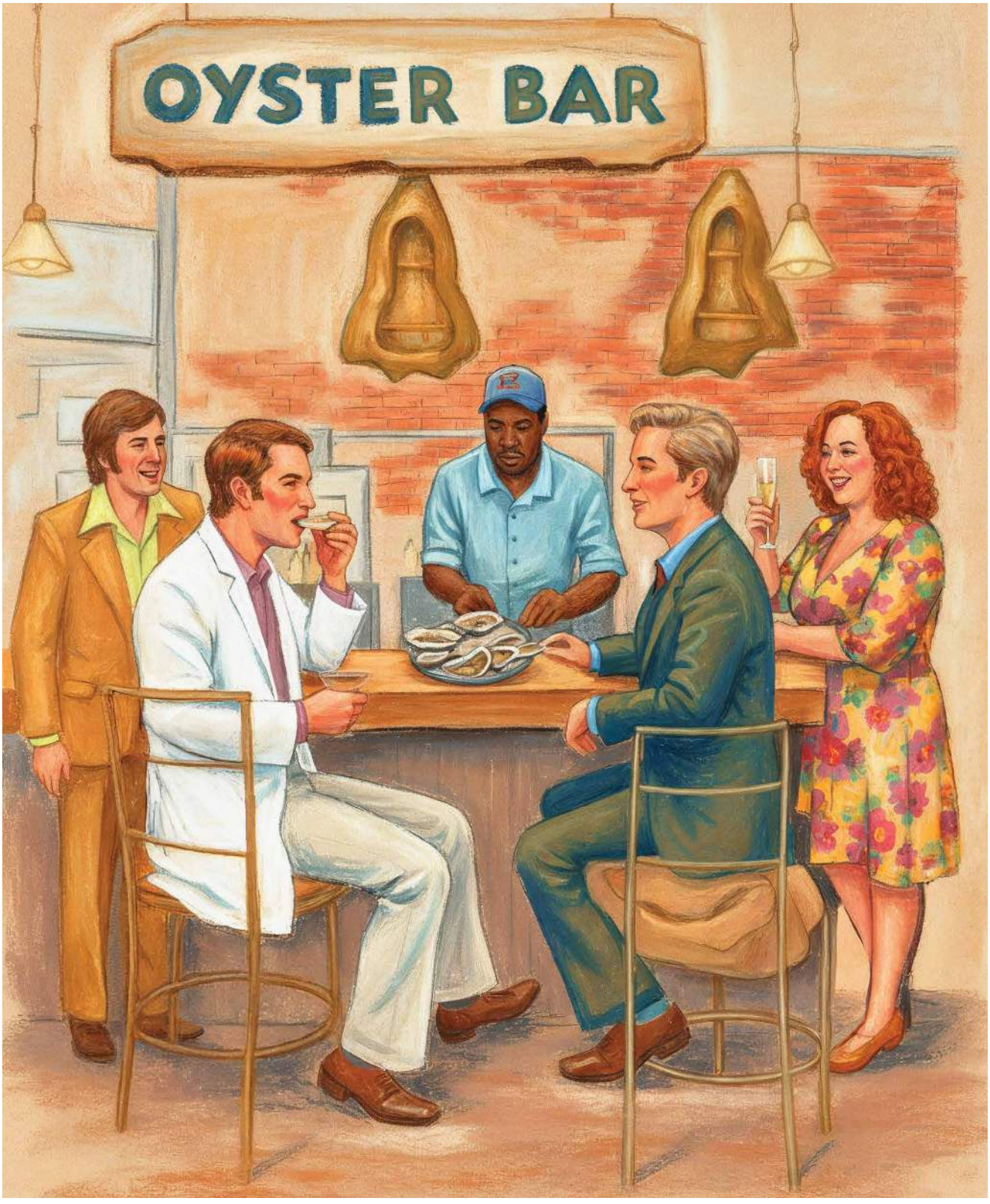

Illustration by Sarah Riedmann

It was a brave man who first ate an oyster

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Until we took up residence in New Orleans' French Quarter shortly after being married, my bride, under no circumstances, could be enticed, coerced, or otherwise moved to eat an oyster. She was a meat-and-potatoes gal. In fact, had I not taken over culinary command of the household following our wedding, we would, to this day, have been eating an unvarying diet of meatloaf alternating with a pork chop casserole. Fortunately, New Orleans expanded my spouse's gustatory horizon. She came to relish oysters as much as I did, and her relish for them persisted despite the oyster-associated hepatitis investigation that launched my brief acclaim as an epidemiological marvel.

It began in November 1973, with a telephone call from a fellow epidemic intelligence service (EIS) officer, Ben P., who the Centers for Disease Control and Prevention (CDC) had assigned to the Houston Department of Health. Ben was the CDC's quintessential EIS recruit: a graduate of Harvard University with a medical degree from Case Western Reserve and postgraduate training at Johns Hopkins. Moreover, he had rapier-sharp wit and a face made for radio.

"We've found clusters of hepatitis A in Houston, Texas, and Calhoun, Georgia," Ben said. "These cases may be caused by Louisiana oysters. Would you be interested in helping us with the investigation?"[1]

"Interested," I exclaimed. "I'd be thrilled!" I could not wait to put the fundamentals of shoe-leather epidemiology learned at the knee of Alexander Langmuir at the CDC to use and see for myself if they actually worked. "If there is a problem with Louisiana oysters," I assured Ben, "Our health department, especially the sanitary engineers monitoring oyster-growing areas, will want to know about it and correct the problem as quickly as possible."

In fact, these engineers were openly skeptical, as they should have been, at least initially. After all, Louisiana's oyster growing, both then and now, generally occurs far from populated areas with minimal exposure to human sewage over the course of an average year. "Was the hepatitis clearly oyster associated?" the engineers demanded to know. "If so," they asked, "how were the oysters in question identified as originating from Louisiana waters?" The engineers wondered as well whether the oysters were harvested from approved oyster-growing areas, whether they were contaminated before or after harvesting (regardless of the state of origin), and whether the problem was of a magnitude to be treated as a true outbreak. All appropriate questions.

An exhaustive investigation ultimately provided irrefutable epidemiological evidence of a bona fide outbreak of hepatitis in Houston, Calhoun, and also New Orleans caused by consumption of Louisiana oysters. The engineers, even after hours of painstaking review of the results, remained unconvinced, however.

An army of workers from various federal and state agencies had participated in the investigation. It included not just two eager and, I might add, shrewd, EIS officers, but also numerous Louisiana health officials, the Louisiana Division of Human Resources, the Louisiana Wildlife and Fisheries Commission, the seafood section of the Louisiana Division of Environmental Health Services, and representatives from the Houston Health Department, the Georgia Department of Human Resources, the Consumer Protection Division of the Georgia Department of Agriculture, and the Gordon County Health Department of Georgia.

Ben and I had anticipated grateful recognition of our team's work, if not raucous applause, when we presented the data to the sanitary engineers. Instead,

the chief engineer was unmoved. "If these cases of hepatitis were, in fact, oyster-associated, which is still open to question," he insisted, "the oysters had to have come from somewhere else or been contaminated after they were harvested."

Ben, who was in no mood to suffer fools gladly, stood up to reply as follows: "Well, let me help you understand how compelling the evidence is that Louisiana oysters were responsible for the epidemic. Imagine, if you will, that I caved your skull in with a ball-peen hammer, you fell to the floor dead, yet someone claimed that you died from a heart attack immediately before you hit the floor. That person's claim would be as difficult to disprove with absolute certainty as your claim that the oysters which caused the outbreak came from outside Louisiana. However, any reasonable person would conclude that the hit to your head caused your death, much as any reasonable person would conclude that Louisiana oysters were responsible for the outbreak, especially given the reems of data that we have just presented."

The report, of course, left no doubt that Ben and I had shown the source of the hepatitis outbreak or that the shoe-leather epidemiology that we had used had been a credit not just to Langmuir, but also to the CDC, the United States Public Health Service, and US medicine in general. The investigation effectively excluded contamination of the oysters after they had been harvested, whether on the oyster boats, at the oyster shipper's establishment, or during subsequent shipping and handling. Interviews with the oystermen who had harvested the incriminated oysters allowed us to identify the approved Louisianan waters of Black Bay and Bay Crabe as the areas where the oysters had been harvested. To eliminate the possibility of bootlegged oysters from unapproved waters being responsible for the outbreak, we established that no known contaminated oyster-growing area existed within a day's journey by boat of the incriminated oyster shipper's establishment. Moreover, we provided epidemiological evidence that the flooding of the Mississippi River Valley between April and July 1973 caused polluted water to pour into Black Bay and Bay Crabe through natural and man-made spillways, bathing the oyster beds located there in sewage containing the hepatitis A virus. In addition, by documenting cases of hepatitis A associated with oysters harvested from the same growing areas, waters that had been deemed free of coliform bacteria long after the incriminated oysters were harvested, we confirmed earlier laboratory observations demonstrating that oysters purge themselves of viruses at a considerably slower rate than they do the coliform bacteria that shellfish certification programs monitor.

Of the many lessons learned in unravelling the cause of this outbreak was one long ago attributed to Jonathan Swift: "It was a brave man who first ate an oyster." Given that oysters filter up to 40 gallons of water per hour to obtain oxygen and nutrients, eating them is brave indeed. If the water in which the oyster resides is polluted (for example, with such pathogenic bacteria as *S. typhi* or such viruses as hepatitis A), that bivalve will have filtered, concentrated and retained the polluted microbes and, once consumed, exact revenge through typhoid fever, norovirus, and hepatitis A, among other food-borne illnesses.

This was one of the facts about oysters rattling around inside my mind as members of the investigation team migrated to the restaurant Pascal's Manale for a victory celebration following our presentation at the Louisiana Department of Health. The mood was joyful, festive, and congratulatory with hugs all around. We were proud of our work. In showing the failure of Louisiana's shellfish certification program to prevent an outbreak of oyster-associated hepatitis, we had demonstrated the ineffectiveness of shellfish certification programs in general. Our findings raised the possibility that eating raw oysters is never entirely safe.[2]

While waiting to be seated, we suddenly realized that Ben, our hero, our leader, the driving force behind our investigation, had disappeared. He had vanished without a word, which seemed strange, given the pivotal role that he had played in bringing us all together. Our cursory inspection of the immediate area failed to discern him. However, on wider reconnaissance, we discovered Ben belly up to the restaurant's bar ingurgitating raw oysters on the half shell. After a brief pause of stunned reflection, the investigators of our group meandered one-by-one to the bar to enjoy oysters on the half shell as a just reward for a job well done.

References:

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2. Mackowiak PA, Caraway CT, Portnoy BL. Oyster-associated hepatitis: Lessons from the Louisiana experience. *Am J Epidemiol.* 1976; 103: 181–91.

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