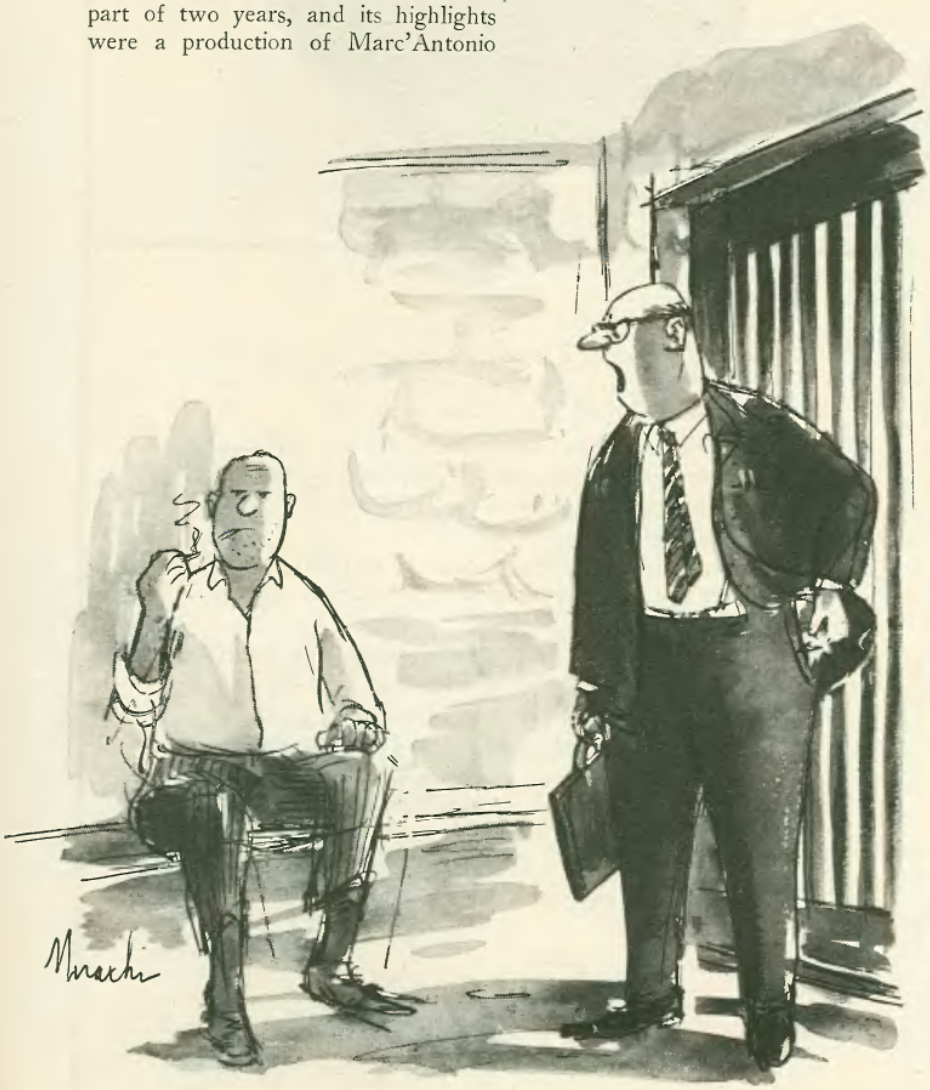
OUR FAR-FLUNG CORRESPONDENTS

A QUESTION OF REVERBERATION

AN opera house is judged by its acoustics, and the men responsible for the reconstruction of the bombed and burned-out Vienna Staatsoper—a project that got under way almost ten years ago and has been completed only in the last week or two—have worried all along about how the result of their labors was going to sound. So have the one million seven hundred thousand citizens of Vienna, all of whom consider themselves joint owners of the opera house, even though some of them would never think of going to it. Opera was first heard in Vienna more than three hundred years ago, and it has played a singularly prominent part in Viennese life since at least 1666, when Emperor Leopold I celebrated his marriage to Margaret Theresa of Spain by sponsoring the world's first great opera festival. It lasted for the better part of two years, and its highlights were a production of Marc'Antonio Cesti's "Il Pomo d'Oro," with a cast of a thousand singers (and a deficit of a hundred thousand gulden), and an al-fresco ballet entitled "La Contesa dell' Aria e dell' Acqua," in which the Emperor himself appeared, along with most of his court. Four hundred different operas were produced in Vienna during Leopold's reign, and for that reason, among others, Austrian historians have always spoken well of him.

Over the intervening centuries, Vienna has never been without at least one opera house (sometimes it has had three houses running the year round, and even during the last ten years the Staatsoper company has been performing regularly in two theatres), but its greatest and largest has been the Staatsoper—or the Hofoper, as it was known from 1869, when it first opened its doors, until the end of the First World War, when it was officially renamed. The famous directors and conductors associated with this opera house—Johann von Herbeck, Wilhelm Jahn, Hans Richter, Gustav Mahler, Felix von Weingartner, Franz Schalk, Richard Strauss, Bruno Walter, Wilhelm Furtwängler, Hans Knappertsbusch, Clemens Krauss, Karl Böhm, Josef Krips—have always been more popular with the Viennese than emperors, statesmen, or generals. The private lives of the great singers who have appeared there—Emil Scaria, Amalia Materna, Hermann Winkelmann, Theodor Reichmann, Rosa Papier, Pauline Lucca, Marie Renard, Anna Bahr-Mildenburg, Marie Gutheil-Schoder, Erik Schmedes, Richard Mayr, Leo Slezak, Selma Kurz, Alfred Piccaver, Emil Schipper, Maria Jeritza, Lotte Lehmann—have always been regarded as public property. The most exclusive club in town is the Wiener Philharmoniker, whose hundred and five members make up the Staatsoper's orchestra; they have a reputation for being as temperamentally difficult as they are artistically competent, and the Viennese call them, not without respect, "the hundred prima donnas." The signing of the Austrian State Treaty last May 15th was a great event for Austria, but in many ways the reopening of the Staatsoper on Saturday night, November 5th, will be a greater one—something on the order of a nationwide housewarming or, as some people have been saying, "Austria's Coronation Day." The opera is to be Beethoven's "Fidelio," and the house has been sold out, of course, for weeks, even though good seats went for as much as two hundred dollars apiece.



"You're not kidding anybody, Conway. I know damn well, and you know damn well, I had my wallet when I came in here."

Most of the people who have set themselves up as consultants on matters of acoustics contend, not unnaturally, that by applying certain laws of physics and using certain testing devices they can determine in advance how hospitable to sound a new auditorium will be. The fact is, however, that several auditoriums built in Germany recently under the guidance of consultants who presumably applied the laws of physics and used the testing devices have turned out to have dreadful acoustics. (When Berlin's new concert hall at the Hochschule für Musik, which was hailed in advance as Germany's finest auditorium, opened last year, it proved to be an acoustical atrocity; in some seats disconnected noises seemed to be bouncing off the rear wall of the hall, in others multiple echoes closed in from all directions, and in still others practically no sound at all could be heard. Although years of

acoustical study had gone into the design of the building, it was discovered after the first few concerts that the ceiling and the side walls were all wrong in relation to one another and to the size of the room, and the only thing the technicians could do was put up floor-to-ceiling hangings on the walls and hope that they would not only absorb the unwelcome noises but spread the music around more evenly. This has been helpful, but the acoustics are still far from satisfactory.) The sad truth is that while scientists in many fields can foretell with unvarying accuracy what will result from a combination of known factors, those who specialize in acoustics seem to be on no surer footing in making their forecasts than meteorologists are in making theirs. From the evidence, it appears that no one can say for sure what the acoustical qualities of an auditorium will be until it is finished, furnished, heated, and filled with musicians, music, and listeners. And if the qualities turn out to be disappointing, it will very likely be expensive to correct them—if it can be done at all.

IN times past, the designers of opera houses perhaps knew little or nothing about the science of acoustics, but a few of them, aided either by instinct or plain good luck, produced auditoriums in which the acoustics are fine—notably, Milan's La Scala, Venice's Teatro Fenice, New York's Metropolitan, and Barcelona's Liceo. Until the afternoon of March 12, 1945, Vienna's Staatsoper could have been added to this list. The Staatsoper, or Hofoper, which was built conveniently close to the Imperial Palace, was a blending of Venetian and Spanish Gothic with Florentine and French Renaissance, designed by Eduard van der Nüll and August Siccard von Siccardsburg. The house took eight years to build, from 1861 to 1869, and neither architect lived to hear an opera in it. While it was under construction, they were mercilessly lampooned—by some people for being too unoriginal, by others for being too revolutionary, and by still others for being merely eclectic. A popular ditty of those times went:

Der Siccardsburg und van der Nüll,
Die haben ihren eignen Stül.
Ob griechisch, römisch, Renaissanz,
Das ist den beiden alles ans.

(The Siccardsburg and the van der Nüll,
They have their own style.
Greek or Roman or Renaissance,
It's all the same to them.)

The criticism proved too much for van der Nüll, and in 1868 he committed

suicide. Von Siccardsburg died soon afterward—of a broken heart, many Viennese said. In later years, both men were widely and extravagantly praised by qualified authorities as the creators of one of the finest buildings on the Ringstrasse—the Hapsburg monarchy's Via Triumphalis.

On the afternoon of March 12, 1945, American planes dropped five bombs on the Staatsoper, setting fire to the stage and the auditorium. The city's water supply had been knocked out by previous bombings, and every able-bodied member of the Vienna Fire Department had been drafted into the Volkssturm, so there were neither the means nor the men to save the building. It burned all the rest of that day and throughout the night, while throngs of Viennese looked on, many of them crying with despair and frustration and none of them able to do a thing about it. At two o'clock in the morning, the roof of the auditorium collapsed. Ever since that night the Viennese have looked upon the burning of the Staatsoper as their greatest collective tragedy of the war. It had never occurred to them that their opera house might be bombed; in their eyes it was a sort of sanctuary, mystically immune to the destructive forces of war. Practically everybody who had ever been associated with the Staatsoper—and a great many people who hadn't—had stored musical instruments, jewelry, personal documents, and other valuables in the building's large cellars, where, it was agreed, they would be absolutely safe. All these possessions were destroyed by the fire, along with the sets for a hundred and twenty operas, and more than a hundred and sixty thousand costumes. There were no casualties, for nobody was in the building at the time of the bombing; the autumn before, the Nazis had closed theatres of all sorts, and the Staatsoper had not been used since June 30, 1944, when Hans Knappertsbusch conducted "Götterdämmerung" there. (Belatedly, the Viennese noted the prophetic significance of Brünnhilde's line "The dusky twilight closeth on us.") By the time the fire had burned itself out, only the massive walls and the lobby were left; the stage and the auditorium were a giant, burned-out shell.

A great many of the Viennese who watched the opera house burn had been bombed out themselves and had no prospect of finding a home in the foreseeable future, but they never doubted for a moment that one of the city's most pressing jobs was to restore the wrecked Staatsoper to its former splendor. Few

of them, however, could have guessed that it would take ten years and ten million dollars to do this—a longer, costlier job than the construction of the original building. At first, there was some talk of starting from scratch and putting up a brand-new opera house, but this idea didn't get very far; after all, the French Renaissance façade and the main lobby, with its marble pillars, its large frescoes, and its magnificent candelabra, were intact, and an overwhelming majority of the Viennese preferred to preserve what they could of the old house, which was rich in tradition and a constant reminder of the city's past grandeur. The actual work of reconstruction was somewhat slow in getting started, for five thousand tons of rubble had first to be removed, a hundred and fifty carloads of twisted girders had to be hauled away, the walls had to be reinforced, and a temporary roof had to be put up. From time to time during the years of rebuilding, work came to a standstill for lack of money or materials. Most of the money was provided, bit by bit, by the government, hard-pressed though it was for funds, but the last hundred million schillings—four million dollars—was raised by an issue of seven-per-cent bonds that was enthusiastically oversubscribed by the public.

During the first nine years of its reconstruction, the Staatsoper, which stands in the very heart of Vienna, was screened from the eyes of curious passersby by a high wooden fence, but many tantalizing stories drifted out about the magnificence of the new house, and the facilities it would have—air-conditioning, elevators, a vast stage, and so on. Reassuring as all this was, the Viennese have been uneasy from the start about one thing: How is the new house going to sound? Musicians, acoustical experts, and the public at large have been arguing this question for ten years, and they are arguing it to this day. Some say that the acoustics will be the same as they were in the old house, since the basic form of the building has been retained. Others gloomily liken the old house to an old violin, attributing its warm, luscious, sweet "Viennese" sound to the aged wood of its fixtures, and pointedly observe that new violins aren't in the same class with instruments that have been mellowed by time. Pessimism has been especially widespread among singers; the new house, it has been whispered, will prove to be a deathtrap for all but the most powerful voices—and how many really powerful voices are

left, anyway? These fears have been accentuated by the fact that since the end of the war the Staatsoper company has made its home in much smaller quarters—the venerable Theater an der Wien, which was four years old when Beethoven's "Fidelio" had its première there, on November 20, 1805. (It was a failure.) The Theater an der Wien is a lovely, intimate house, seating only nine hundred and fifty, in contrast to the new building's capacity of about two thousand, and its acoustics are warm and somewhat muted—ideal for Mozart and parlando-style operas, like "Der Rosenkavalier," but something less than ideal for works by Verdi and Wagner, in which power and brilliance of sound are essential. Some singers, having grown accustomed to the limited requirements of the Theater an der Wien, aren't looking forward to adjusting themselves to an auditorium of nearly three times the area. They are not necessarily reassured by a prediction from Heinz Keilholz, a well-known German acoustics engineer who has been hired as a consultant by the opera management. The new house, he says, will have "the bright, modern sound that people have come to admire in high-frequency recordings."

A FEW weeks ago, in the midst of all the acoustical suspense, I walked into the office of a friend of mine named Wolfgang Teubner, who is a member of the engineering staff at work on the opera building. I've known Teubner since the late twenties, when we met regularly in the Staatsoper's fourth, and topmost, balcony. The fourth balcony, which offered the best acoustics, or so I thought, as well as the cheapest seats, was frequented by *Opernnarren* (opera fools), including the members of the claque, a group of impecunious young men with callused palms and uncompromising artistic standards, to which Teubner and I belonged. The members of the claque were contemptuous of the moneyed people in the stalls and boxes down below, where, we firmly told ourselves, the hearing was awful. (I sat downstairs a few times, at the invitation of a generous uncle, and I had to admit to myself that the hearing wasn't at all bad, but I never dreamed of confessing this to my fellow-*claqueurs*.) Teubner and I were up in the fourth balcony almost every night. He was studying engineering, to please his parents, and singing, to please himself; I was studying law, for my family, and the violin, for myself.

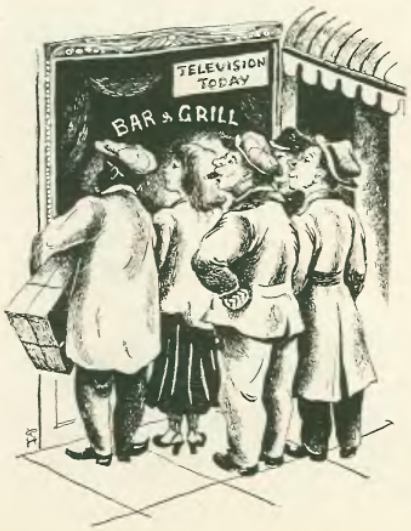
I knew that in the old days Teubner

had had a fine tenor voice, and as we renewed our acquaintance in his office, I asked him how he had made out with it. He replied that he had become a *Heldentenor* in the thirties, after I left Vienna, and that no sooner had he really got embarked upon his singing career than the war began. When it was over, engineers were in greater demand than *Heldentenöre*, and Teubner had taken a job as a *Baurat*, or building surveyor, in Austria's Ministry for Commerce and Reconstruction; the pay didn't amount to much and promotion was slow, he said, but he did have old-age security and an official title. As a *Baurat*, Teubner was promptly assigned to the opera project—one instance, at least, in which bureaucracy has succeeded in filling a round hole with a round peg.

A slim man with a milk-white face, blond hair, thick glasses, and a deceptively soft voice—he can raise it to a startling fortissimo in the "Schmiedelieder" from "Siegfried"—Teubner told me that at the moment, as I might have suspected, he was pretty much preoccupied with acoustics. "To judge by the latest coffeehouse rumors, everybody in town is convinced that the acoustics are going to be sour," he said. "Naturally, we won't know for certain until opening night, but we hope to get some indication next Monday at the first full orchestra rehearsal in the new house. Ever since the beginning, we've kept our fingers crossed and prayed for the best. One thing the coffeehouse critics forget is that high-frequency recordings have made people's hearing more sensitive than it used to be. Why, only a few years ago the highest frequency you would find on recordings was five thousand *Hertz*, or cycles per second—about four octaves above middle C. Now they're making recordings at frequencies up to fifteen thousand *Hertz*. When we first heard these high-frequency recordings, we all said they sounded too sharp—perhaps a semitone high in pitch—but now we've accepted them, because they reproduce actual sounds more exactly than ever before. And they have taught us to hear more of the overtones of music. You only have to listen to an old Caruso record to realize how far we've progressed in a short time. Our problem is to meet this modern challenge, and to do that we've got to make the acoustics of the new house not only as good as they were in the old house—though many people say we can't possibly do that—but better. It's largely, of course, a question of reverberation. The reverberation

in the old house was one and three-tenths seconds. That's much too short. The Theater an der Wien isn't really much better; we love it because it's so *gemütlich*, but it has a reverberation of only one and thirty-eight hundredths seconds. Much too short, too."

I asked Teubner what he meant by reverberation. "Well," he said, "in the sense that I'm using it, it's a standard of acoustical measurement. In an auditorium, sound should bounce off the walls, the ceiling, and the floor until the whole place is uniformly filled with it. If the source of sound stops, the sound remains audible for a while—sometimes for as long as three seconds. That is called reverberation—the prolongation of sound after it has left its source. Reverberation strengthens sound, and it is desirable up to the point where it starts to interfere with succeeding sounds. The length of time that a sound can be heard after being originated is used as a measure of a room's reverberation. If the reverberation is too short, the sounds we hear are muffled, dead. If it is too long, the sounds jostle one another; syllables and phrases are hard to understand, and tones flow into one another and get confused. The most favorable reverberation count for an average-size opera auditorium has been found to be from one and a half to one and eight-tenths seconds, or even longer. The sounds in the Theater an der Wien, with their short reverberation, lack brilliance; too much sound is swallowed up by the upholstery. Personally, I think the Festspielhaus at Bayreuth has nearly perfect acoustics. For one thing, it's funnel-shaped, and that's a great advantage, because ordinary parallel walls often create dangerous reflections. Then, it has no boxes, which is all to the good,



too, for boxes have a way of absorbing sound instead of reflecting it. You can hear every word at Bayreuth—small voices seem to grow, and singers never have to strain. Bayreuth has a very long reverberation—two and four-tenths seconds. That's even longer than the two and two-tenths seconds in the auditorium of the Gesellschaft der Musikfreunde, which to my mind has better acoustics than any other hall here in Vienna—so far, anyway."

Jotting down Teubner's comparative figures, I noticed that the Theater an der Wien was considerably closer to the ideal figures he had cited than the Gesellschaft and Bayreuth were, and I asked him why, in view of this, the acoustics of the first should be so poor and the acoustics of the other two so good.

He gave me a pitying smile, and replied, "Both the Gesellschaft and Bayreuth are large auditoriums, and the bigger the house is, the longer the reverberation may be without blurring the enunciation. Mind you, I say *may* be." I began to see why acoustical engineers have sleepless nights. Teubner, however, went on as if he had written "Q.E.D." on his thesis. "Even Cherubino's aria from 'The Marriage of Figaro' sounds good in the Gesellschaft, and I consider that a real test," he said, and began to sing "Non so più cosa son" at high speed. Despite the exaggerated allegro, I could make out each syllable, but his voice certainly seemed to lack brilliance. Teubner apparently noticed this, too, for he stopped abruptly, with a shrug of disgust. "This office is soundproofed," he said. "No reverberation whatsoever. But to get back to the subject. Every listener absorbs sound—men, in their woollen suits, a little more than ladies, in their silk dresses—and no opera house sounds the same when it is empty and when it contains two thousand living sound-absorbers. In the perfect auditorium, which doesn't exist yet, the seats will be upholstered in such a way that each one will absorb the same amount of sound when it is empty as a person does when sitting in it. Well, we haven't figured out how to manage that yet. Some people suggested that the Staatsoper be rebuilt along the lines of Bayreuth—funnel-shaped and without boxes—but tradition won out, as it always does in Vienna. So the auditorium is still shaped like a horseshoe, and we still have boxes and galleries. Another advantage Bayreuth has is a covered orchestra pit, but that wouldn't work here, either. Several

of the world's leading conductors were consulted, and every one of them opposed the idea. One of my colleagues remarked that conductors might welcome the acoustics of a covered pit if it had a Plexiglas dome through which the conductor would be visible to the audience."

Teubner chuckled, but his manner was tense. "It's one compromise after another in this business," he went on. "There's always a battle between the designers, who want to install elegant heavy silks, velours, and brocades—all highly sound-absorbing—and the acoustics experts, who don't care how a hall looks as long as it sounds right. In this case, we reached our compromise after a great many long-winded round-table conferences. It was decided that no heavy fabrics would be used. The backs of the seats are to be covered with a hard velvetlike material that absorbs almost no sound, and the walls of the boxes are to be lined with a hard artificial-silk damask, which reflects sound, instead of swallowing it up, the way the velours tapestries did. Oh, sure, the velours gave the auditorium a sort of feudal dignity, but the hell with feudal dignity. You can't have everything."

Teubner paused thoughtfully after this mild outburst, and before we started talking again we were joined by another member of the Reconstruction Ministry staff—a tall, diffident-looking man named Josef Krzisch, who, for all his reserved manner, has earned the reputation of being an able expediter. A couple of years ago, he was placed in charge of the opera job, with instructions to finish it up as swiftly as possible. I asked him if there was any danger that everything wouldn't be ready for opening night. "We'll be ready, no matter how many last-minute bottlenecks we run into," he replied. "For months, people have kept asking why we don't speed things up by hiring more men. As it happens, we've had a lot more men working here than we originally planned to have, and, besides, there's a limit to everything. You've heard the story of the general who was told that it would take two hundred men three weeks to build an airfield and who then ordered three thousand men to build one in a day. Well, I don't know how the general made out, but I do know that we couldn't have worked that way here. We couldn't put in the seats before the floor was ready, and we couldn't put in the floor before the wires were laid, and we couldn't lay the wires—" Krzisch threw up his hands, and turned to Teubner. "And how about you?" he

asked. "Will the orchestra be ready to rehearse next Monday morning?"

"At ten sharp," Teubner said, and added, as if he were talking to himself, "Then at least we'll begin to know where we stand acoustically."

"I thought you knew already," Krzisch said, with a slight grin.

"Of course. Of course we know," Teubner said. "No doubt about it, we *do* know."

SHORTLY before ten on Monday morning, I made my way down Kärntnerstrasse to the Staatsoper's stage door, which before the fire was used only by the male members of the company. (The ladies used a door on Operngasse, around on the other side of the house.) This stretch of the sidewalk is covered by an arcade, and back in the days when I was a member of the claque, my associates and I would meet under it every day at noon to receive our orders for the evening from our boss; then we would hang around picking up backstage gossip and paying our respects to our favorite singers and conductors as they showed up for rehearsals. We also had our girl friends meet us there, hoping to impress them with our connections. There was a park bench under the arcade, and in the summertime retired singers would sit on it, staring wistfully at the younger people going through the stage door. The great Wagnerian *Heldentenor* Erik Schmedes, who in his time had been Europe's finest Tristan, was one of the bench sitters—still, in those days, an imposing, if somewhat pathetic, figure, always impeccably dressed in bowler, cutaway, striped trousers, and gray spats, with a white carnation in his buttonhole and a silver-knobbed cane in his hand. Schmedes would sit there for hours, talking grandiloquently about the past and commenting sardonically on the opera's current leading *Heldentenor*. (He used to say the man had the voice of a railroad conductor.) Sometimes the great basso Richard Mayr would relax on the bench between rehearsals. Mayr was no has-been; he sat there, he said, because he liked park benches, and especially park benches that weren't in a park.

There was a pile of lumber where the bench had stood, and part of the arcade was boarded up. From somewhere under my feet came the noise of pneumatic hammers. I went through the stage door and at once became aware of an unfamiliar odor. In the old days, there was always the mauso-

leumlike smell of dust and marble—a smell that I could still identify anywhere on earth. Now there was a smell of paint and linoleum. People were hurrying about with boxes and packages, and there was a sort of exuberance and tension in the air that reminded me of an ocean liner an hour before sailing time. The elevators I had heard about were there, all right—four of them—but they weren't running yet, so I walked up a flight of stairs and went down a dimly lit corridor, hoping it would lead to the auditorium. But I was lost in this new setting, and I was relieved to run into Ernst August Schneider, one of the Staatsoper's half dozen artistic directors, who function as upper-echelon factotums. He is a tall man with silvery hair and the savoir-faire of a diplomat, which comes in handy in his job. Ordinarily, Schneider looks aloof and imperturbable, but just then his face showed signs of strain. I asked him if he, too, was worried about the acoustics.

"That's the only thing I'm not worried about," Schneider said. "I've been so busy lately I haven't had time to ask myself whether there will even be any acoustics. Not only have we been giving opera every night at the Theater an der Wien, but we've been putting on regular performances at the Volksoper and occasional ones at the Redoutensaal. That means three complete casts. Then everybody gets sick, and I have to telephone all over Europe to find ersatz Lohengrins and Aïdas. And as if that weren't enough to drive a man crazy, everyone comes to me with complaints about the new house. Yesterday some members of the chorus were squawking about their new dressing rooms. At the Theater an der Wien, they get dressed in a hole in the wall, and it's a miracle that they don't fall down those rickety stairs on their way to the stage. Here they have big dressing rooms and rehearsal rooms, to say nothing of elevators and canteens, but all they do is grumble." Schneider told me he was going to the auditorium, so I went along with him. He led me down another corridor, where workmen were laying linoleum and we had to pick our way along some planks, and presently we came to a boarded-up door. Schneider had a couple of the workmen open it, and there we were in the auditorium.

For a second, I had a sharp feeling of disappointment. Perhaps I had unconsciously expected to find the old house again—a symphony in slightly faded ivory and gilt, the ivory the

shade of an old billiard ball and the gilt with the reddish patina of age. At any rate, I wasn't prepared for the brightness and newness of the vast room. The boxes were decorated with gilded-stucco leaf designs that shone like a jeweller's shopwindow display. The curtain showed Orpheus and Eurydice in an angular, stylized setting, and they didn't look as if they belonged there. Still, I was relieved to see that no effort had been made by twentieth-century copyists to re-create the baroque paintings that formerly ornamented the ceiling; in their place was a simple, modern pattern of gilded-stucco rays. The seats were not yet in place, scaffolding surrounded the upper tiers of boxes and men and women in white smocks stood on it energetically applying gold leaf, and the whole room was illuminated by a garish white light provided by several powerful bulbs suspended from the ceiling, for the chandelier had not been installed. The place smelled of damp mortar, and while there was only a touch of chill in the air outside, here it was definitely cold—a bone-penetrating cold. From the fourth gallery came the sound of hammering.

The members of the orchestra, in their hats and coats, were in the pit, standing around and chatting. Schneider and I sat down on a couple of wooden crates off to one side of the room just as the curtain went up; a number of singers were wandering about uncomfortably, the men with scarves around their necks and the ladies in furs. Near the pit were several large black boxes, stencilled in white with "WIENER PHILHARMONIKER" and all but covered with hotel stickers from Spain and Portugal, where the orchestra had recently been on tour. Two women in black aprons appeared and began to lift musical instruments out of the boxes, dust them off, and put them on the floor, while the musicians, one by one, straggled over and picked them up. Then Dr. Karl Böhm, who has been the director of the Staatsoper, and its leading conductor, for the past year, came down from the rear of the house, surveyed the scene dourly, and asked Schneider why there was no heat in the auditorium. Schneider said he guessed the heating system wasn't working yet. A diva who was strolling by overheard the remark, and she turned on Schneider and said, "Do they really expect us to sing in this icebox? And the cold's not the only thing wrong with the place. All this talk about the finest opera house in the world!

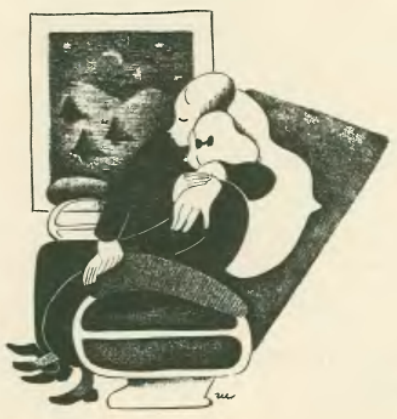
Oh, yes! Plenty of gold leaf for the public, but no private showers for the soloists!" She glared at Schneider. He glared back and said, "Don't blame me. I didn't build the house."

Rudolf Moralt, one of the conductors who work under Böhm, came by and sat down on a crate beside Schneider. "I'm terribly excited," he said. "I'm so happy to be here today. There were times when I just about gave up hope that this day would ever come."

"I'm glad somebody feels that way," Schneider said. "Everybody else seems to be just cold and angry."

"They're all excited, even the ones who don't show it," Moralt said. "Anyone who isn't excited today doesn't belong here. But they do complain a lot, don't they? Talk about being cold! You didn't hear them complain back in the winter of '47, in the Theater an der Wien. In those days, you could see their breath when they sang."

Taking another look around, I saw Teubner standing in the rear of the auditorium, and I walked back to join him. "I wish they'd begin," he said nervously, rubbing the palms of his hands against his jacket. He pointed toward the top balcony and said, "Remember?" I did, of course, but even more vividly than our adventures in the claque I remembered the last time I'd visited the Staatsoper. It was on a bleak winter day in 1947, when the reconstruction was barely under way, and when I looked up to see what had become of the top balcony, I found nothing but a gray gash. "We've done away with the pillars and the arches that obstructed the view of the stage from the fourth balcony, and there's no reason why the acoustics up there shouldn't be as good as they ever were," Teubner said. "Do you remember how bad the third balcony was acoustically—just as bad as the fourth was good. Well, now it's a bit higher than it used to be, and we've put in some sound-



reflecting material behind the seats. That should make quite a difference."

As we spoke, workmen began lugging rolls of heavy fabric out onto the floor of the auditorium and draping the stuff over chunks of wood, in an effort to approximate the sound-absorbing potentialities of a house full of seats and people. A horn player came up to us and complained that it was terribly crowded in his corner of the pit; he wanted to know why the pit wasn't larger. Teubner told him it was the largest opera-house pit in the world—and at least a third larger than the one in the Theater an der Wien, where he had never heard the horn players complain. "Some people will never be satisfied," he said to me as the horn player walked away. "Below the auditorium, we've installed a large, air-conditioned tune-up room for the musicians, with built-in, velvet-lined closets shaped to fit their instruments. They've got their own washrooms, and a private stairway leading directly to the pit. They've got a smoking lounge of their own, too. At the Theater an der Wien they have to go outside in the street to smoke. We've tried to please everybody, but it sometimes seems as if we're going to wind up pleasing nobody."

Apparently, Teubner's chronicle of the luxuries about to be bestowed upon the unappreciative musicians took his mind off the imponderables of acoustics for the moment. He seemed more cheerful than he had during our meeting the week before, and he began telling me of some of the other things that have been done to make the new house an improvement over the old one. Most of the basement space that was used in the old days for workrooms and storage had, he said, been turned into rehearsal rooms, for the orchestra, ballet, ensembles, and soloists; carpenters and painters and other workmen engaged in building sets have been transferred to the old Imperial Armory, and the sets are now stored there, while the smaller workshops for costume makers, milliners, and bootmakers are now located in a nearby building, formerly occupied by the Ministry of Social Affairs, which is linked to the opera house by an underground tunnel. All the dressing rooms have been wired for sound so that the singers can follow the performance, which should soothe their nerves as they wait to be called on the loudspeaker. The house is to be heated by radiators supplied with hot water from boilers in the Imperial Palace, where they will be less of a fire hazard than the old ones in the basement were. And the whole house is to be air-

conditioned; fresh air will be pumped into it from the gardens of the Imperial Palace, which should make a pleasant contrast to the exhaust fumes that used to float in from the Ringstrasse. The pit, which holds a hundred and ten musicians, has three platforms, each equipped with a mechanism for raising and lowering it to stress or minimize the sound coming from it. Moreover, there are special sound-absorbers to mute the efforts of the brass players, who so often dominate the string players, and these, in turn, have the added benefit of sound-reflectors. On the sixth floor of the building, just below the roof, there is an organ, with thirty-two registers and more than twenty-five hundred pipes; it has two keyboards—one right beside it and the other in the orchestra pit. The visible stage can be eighty feet wide, and a hundred and sixty-four feet deep—obviously, all that vast expanse will seldom, if ever, be used at one time—and the cavern over the stage is a hundred and forty-eight feet high. Like the pit, the stage has platforms that can be raised and lowered independently, so that sets can be put up while a performance is in progress. Some of the seats in the auditorium are to be equipped with headset amplifiers, for the hard of hearing, and others are to have reading lamps, for those who want to follow the score. There is an amplifying system with invisible loudspeakers inside the ceiling and at either side of the proscenium to transmit such sound effects as rain and thunder. "But the amplifying system will *not* be used to strengthen weak voices, no matter what rumors you may hear," Teubner said sternly. "Böhm would never allow canned music in this house."

After letting that sink in, Teubner relaxed once more and continued his happy recital. "You remember the small boxes in the rear, above the Emperor's box? They have been turned into control rooms for the producer, the technical director, the chief electrician, and the radio and television engineers," he said. "And the Emperor's box, as you can see, is gone, and so are the court suites, the salons, the Emperor's reception hall, the festival hall, the Archduke's box, and the incognito box. Latecomers, who since the days of Gustav Mahler have never been permitted to enter the auditorium during the overture, will now be able to hear it over loudspeakers in the lobby, and that's something that should make for better dispositions all around."

A small, wizened, mustachioed man in a blue beret came limping up to us on a cane and, with a curt nod to Teubner,

said gloomily, "Are you ready for your Waterloo?"

"I beg your pardon, Professor?" Teubner said politely.

"It's all wrong," said the Professor, pointing his cane at the musicians, who were now tuning up. "The reverberation is much too long. The phrases will be blurred. You'll hear nothing but noise. It will be a national disaster. Don't say I didn't warn you." With that, he stumped off, muttering to himself. Teubner told me the Professor was a prominent opera connoisseur, whose word meant a lot in Viennese musical circles. Then he fell silent.

A perturbed-looking baritone came up and said to Teubner, "I hear the stage is a hundred and sixty-four feet deep and a hundred and forty feet high."

"A hundred and forty-eight feet high," Teubner corrected him grimly. "The stage is higher, and deeper, and wider than the auditorium."

"God Almighty!" the baritone exclaimed. "How am I going to sound in such a cave?" He stared in dismay at the stage, then sighed and walked away.

The orchestra was still tuning up. Teubner told me that Keilholz, the German acoustics expert, was due in from Berlin at any moment and would conduct some scientific sound tests in the opera house that evening. If I'd care to return around midnight, Teubner said, he'd let me know the results. Just then, Böhm took his place on the podium. The tuning-up and talking stopped, but the hammering in the balconies went on. Somebody shouted at the carpenters from the stage, and finally there was silence. Böhm, a short, tense man given to abrupt gestures, made a brief speech to the orchestra. He spoke softly, but we could hear every word from where we stood. "When I was a youngster, getting my first taste of grand opera up there," he said, pointing toward the top balcony, where the carpenters, in their overalls, were now looking down over the rail, "I never thought that one day I would be the director of this new opera house. None of us ever thought that the old house might perish. Well, it was a great house, and we'll work hard to make the new one great. I've been asked to christen the house with the prelude to 'Die Meistersinger,' but we haven't got the music, and some of you musicians tell me that you don't think you know it well enough by heart. So we're going to start with the first act of 'Wozzeck.' No symbolic meaning whatsoever should be attributed to the fact that the

opening words to be sung in the new house will be '*Langsam, Wozzeck, langsam*' ['Slowly, Wozzeck, slowly']."

Mild applause and a flurry of not very mirthful laughter greeted this little joke. Böhm raised his baton. The house grew extremely quiet; for perhaps a minute it seemed that no one was so much as breathing. Even the stagehands, who had been watching the orchestra and the singers with the indifference common to their kind in backstage life all over the world, were now looking on attentively. Then Böhm lowered his baton to signal the beginning of "Wozzeck," and after a short orchestral introduction—just a few bars, fortissimo—the tenor singing the role of the *Hauptmann* began, "*Langsam, Wozzeck, langsam.*" I heard Teubner sigh deeply. It was, I knew, a sigh of relief, for the acoustics were undeniably brilliant—perhaps a bit too brilliant for some people's taste. One could hear the softest pianissimo of the solo violin. Presently, Böhm interrupted the orchestra to correct a mistake, and excited whispering broke out all over the house. Moralt came up to Teubner and shook his hand warmly. "Congratulations," he said. "It will be perfect."

"I hope so," Teubner replied. "So far so good, anyway. The sound is bright and still somewhat young, like new wine. The reverberation is almost two and a half seconds. But when all the seats are installed, and the walls of all the boxes are covered, and the house is full of people, it should come very close to one and eight-tenths. Then we will have the warmth and roundness that many Viennese love so much. It may even suit the Professor. Personally, I wouldn't mind if the acoustics stayed just as they are today. This is *modern* sound."

The diva who had complained to Schneider about the lack of showers sauntered up. "There's too much metal all over the place," she said. "In Hamburg, they put so much iron and steel into the auditorium that everybody had to shout. It was a tragedy. Almost all the singers ruined their voices. Thank heaven I didn't ruin mine."

Teubner bowed to her coldly. "Let's go up to the top balcony," he said to me.

WE left the auditorium and walked through the main lobby, which looked exactly as it had twenty-five years before, with its old marble staircase, its lovely frescoes by Moritz von Schwind, and its lyre-playing

angels. Here the familiar smell of old stone still prevailed, and I inhaled deeply. There was the same long corridor where Teubner and I used to queue up for hours on end, waiting to get in. We made for the stairway that I had run up so many evenings, taking two or three of the low steps at a time and holding my ticket in my left hand and my overcoat in my right. There were a hundred and fifty-five steps, and in the race for a good place to stand—we in the claque had to be content with standing room—youthful sprinters could elbow their way past less nimble people who had been much farther up in the queue. One night, I made those steps in exactly twelve seconds, but even so, faster *Opernnarren* were ahead of me, and by the time I arrived, gasping for breath, the best spots were taken.

Now Teubner and I, no longer young or in a hurry, walked slowly up to the top balcony, found a couple of chairs, and sat down gratefully to listen. Up there, the acoustics left almost nothing to be desired. The sound of the orchestra was lucid and sensuous; I could hear the dynamic nuances and I had no trouble distinguishing the various groups of instruments; the singers sounded as though they were standing right next to me. Teubner, I could see, was feeling better all the time.

After the first act of "Wozzeck," the *Hauptmann* came up and joined us. "It's terrific!" he said. "Your voice comes back to you. You're not singing in a vacuum, as you are in the Theater an der Wien. You know what you're doing. It's my guess that this house will amplify beautiful singing and point up mistakes as well. It will be a challenge to work here."

There was a short break in the rehearsal, and then Böhm conducted the beginning of Richard Strauss's "Die Frau ohne Schatten," which calls for a larger orchestra than "Wozzeck." The house was filled with sound, as a Gothic cathedral is when the organ is being played with all the stops out. In the old house, the soloists usually tried to sing their arias from one of two spots at the sides of the stage, where the acoustics were said to be best, but now the singers were moving about all over the stage, and wherever they moved we could hear them well.

The *Hauptmann* left us, and a few minutes later we had two more visitors—a portly man with a reddish face and carefully brushed blond hair, and, hobbling along behind him, the Professor. The newcomer was Keilholz, who said his plane had just got in from Ber-

lin. After listening attentively to the music for a few seconds, he closed his eyes and seemed to breathe in the sound; he sampled it much as a French wine expert samples a rare vintage.

"Two and four-tenths seconds," Keilholz said presently. "Maybe one-tenth of a second more than that. Some corrections may be necessary, but not many. What do you think, Professor?"

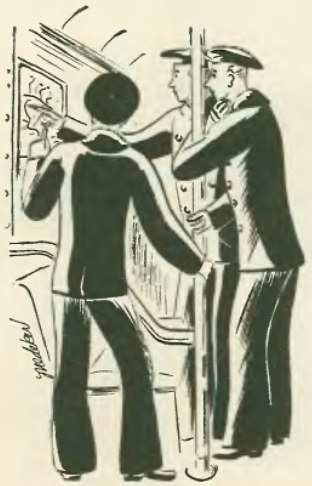
"I think it's a tragedy," the Professor replied. "I hear only noise."

"But we haven't even begun to put in the sound-absorbent material," said Keilholz, with a puzzled look at Teubner, who raised his eyebrows warily.

"The polyphonic structure is lost," the Professor said. "The people of Vienna won't stand for this sort of sound." He banged his cane on the floor to emphasize his point, and then turned and limped away.

Keilholz seemed saddened by the Professor's harsh verdict. "I've had similar arguments over and over again in Germany," he said. "Mostly they're with elderly gentlemen who play chamber music at home and love the muted, intimate, soft sound they achieve there. They don't like our new, bright-sounding halls. But the truth is that many chamber groups are coming to prefer medium-size, bright-sounding halls to the small, intimate ones they used to like to play in. It's all pretty much a matter of what one is accustomed to, I suspect."

When the rehearsal was over, I took my leave of Teubner and Keilholz, who had begun arguing hotly over some esoteric point of acoustics, and went to pay a call on Böhm in his private music room, next to his office. "I liked the acoustics the moment we started to play," he told me. "The tone was full and round. The musicians say that they can hear both themselves and the others. Just a little muting here and there, and



a little less sound around the brass section, and we'll be in excellent shape."

A telephone rang in Böhm's office, and he went to answer it. When he came back, he said angrily, "Again! Someone can't sing tonight. All of them work too much, sing too often, strain their voices. They give four performances a week, work for the radio, make recordings, and travel all over the place, and then they're surprised to find themselves losing their voices while they're still young. It's nothing new, though. I once had an uncle in Berlin, a well-known tenor, who could sing every one of the high Cs in 'William Tell.' He got so carried away by the sound of those high Cs that he would sing them all day long, starting in the morning while he was shaving. He was through at the age of thirty-two. I warn my singers that their most valuable capital is what they have in their throats, not what they have in their bank accounts, but they won't listen to me."

WHEN I returned to the Kärntnerstrasse arcade shortly before midnight to find out about the tests, the stage door was locked. I rang the bell, and presently an old watchman showed up, carrying a big bunch of keys. I asked him whether Herr Teubner and Herr Keilholz were still at work inside. "They're here, all right," he said grumpily. "And maybe you'd say they're at work, considering how crazy everybody is around here. All I know is they've got some loony sitting in the pit and shooting off a pistol. This used to be an opera house, not a penny arcade!"

Sure enough, as I walked down a deserted corridor, I heard a shot, and then another, and another. There was no need to worry about getting lost this time; the shots led me directly to the auditorium, and there, in the middle of the pit, under the glaring lights, sat a man who was firing away with a toy pistol. Keilholz and Teubner were standing on the stage just above him, surrounded by half a dozen sleepy, bored-looking stagehands. Teubner explained to me that he and Keilholz had placed microphones in acoustically strategic spots around the house in order to record the reverberation time of the shots. Then he led me to a room backstage where some weird pieces of apparatus had been set up on a broad table; among other things, there was an electro-acoustical "mute-writer," with a sensitive needle that inscribed an alarmed jiggle on a roll of paper every time a shot rang out and recorded the

rate of "sound decay," and a small black machine, with wires running from it and a dial that showed the intensity of the sound in decibels in various parts of the house. An assistant in a white jacket, who seemed more interested in a ham sandwich he was munching than in the tests, kept watch over the machines and entered figures in a notebook after each shot. Teubner bent over the notebook and studied it as a musician studies a score. Everything was going well, he said; the figures were just the ones they had hoped for. I asked why they used a pistol, instead of musical instruments or human voices, to find out whether or not they had a good opera house. "Because our testing apparatus needs sounds that are at once extremely strong and extremely staccato," Teubner said. "Shots provide the most accurate gauge of reverberation, and there's nothing like them for ferreting out dead spots."

Keilholz came in and took a look at the notebook. "The boys who originally designed this building knew what they were doing," he said. "I wish our modern architects knew as much. I sometimes think there's too much so-called pioneering going on these days. When this house was built, nearly a hundred years ago, people didn't go in for pioneering. They'd studied the designs of the great Italian opera houses, and they built another along those lines. Fine. Until we learn more about the science of acoustics—and we're just beginning—we ought to stick to proved formulas."

I waited to hear what Teubner, with his admiration for the funnel-shaped hall in Bayreuth, had to say about that, but just then one of the stagehands came to the door and asked if he and his companions might go home. It was getting late and they had to be at work early in the morning.

"I've got to be at work early in the morning, too," Teubner said. "But go on home, if you want to." As the stagehand vanished, he remarked, "When I look around at all the technological wonders of this new house and then hear people—singers and musicians, too, not just stagehands—complain about late hours and other inconveniences, I can't help thinking of the fine performances this same outfit put on at the Theater an der Wien in the years just after the war. There was no heat, no food, no money, no costumes, no material for sets. The stage machinery was creaky, the lights were forever going out—everything was on a makeshift basis. In fact, we had nothing but en-

thusiasm and talent—but that seemed enough. And now . . ."

While Teubner was speaking, he had walked to the door, and with his last words he made a sweeping gesture toward the immense stage outside. I followed him out onto it, and he sat down at a piano that had been left standing near the footlights. He played a few chords and hummed a few notes, and then, gradually, his voice grew stronger and he began to sing Cavaradossi's aria from "Tosca"—"E lucevan le stelle." He listened to the sound of his voice—clear and resonant there in the empty auditorium—and nodded with satisfaction.

Keilholz came out of the testing room and walked to the rear of the auditorium. "Well, how does it feel to sing here?" he asked Teubner after listening for a while.

"Wonderful!" Teubner answered. "I'm giving it less volume than when I sing in my living room. No strain at all. How does it sound back there?"

"Fine!" said Keilholz.

Teubner swung over to the "Schmiedelieder" from "Siegfried."

The old watchman came out of the wings, still dangling his ring of keys. "Well, what do you know!" he said, shaking his head. "Who'd have thought that the *Herr Baurat* was a *Heldentenor!* And a good one, too! Any night the regular tenor gets sick, the *Herr Baurat* can take over."

Teubner was singing "*Nothung, Nothung, neidliches Schwert*" in full fortissimo, and there was a contented smile on his face. It seemed to me that for the moment, at least, he not only sounded but looked more like a *Heldentenor* than a *Baurat*. And for the moment, too, no one was giving a thought to acoustics. —JOSEPH WECHSBERG

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Q. When a woman is either standing or seated, talking with a man, and she drops her handkerchief, glove or some such article, and the man does not notice it, should she then pick it up?

A. No. She can call his attention to it by saying, "I believe I dropped by handkerchief."—*St. Louis Globe-Democrat.*

And he'd better be quick.

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