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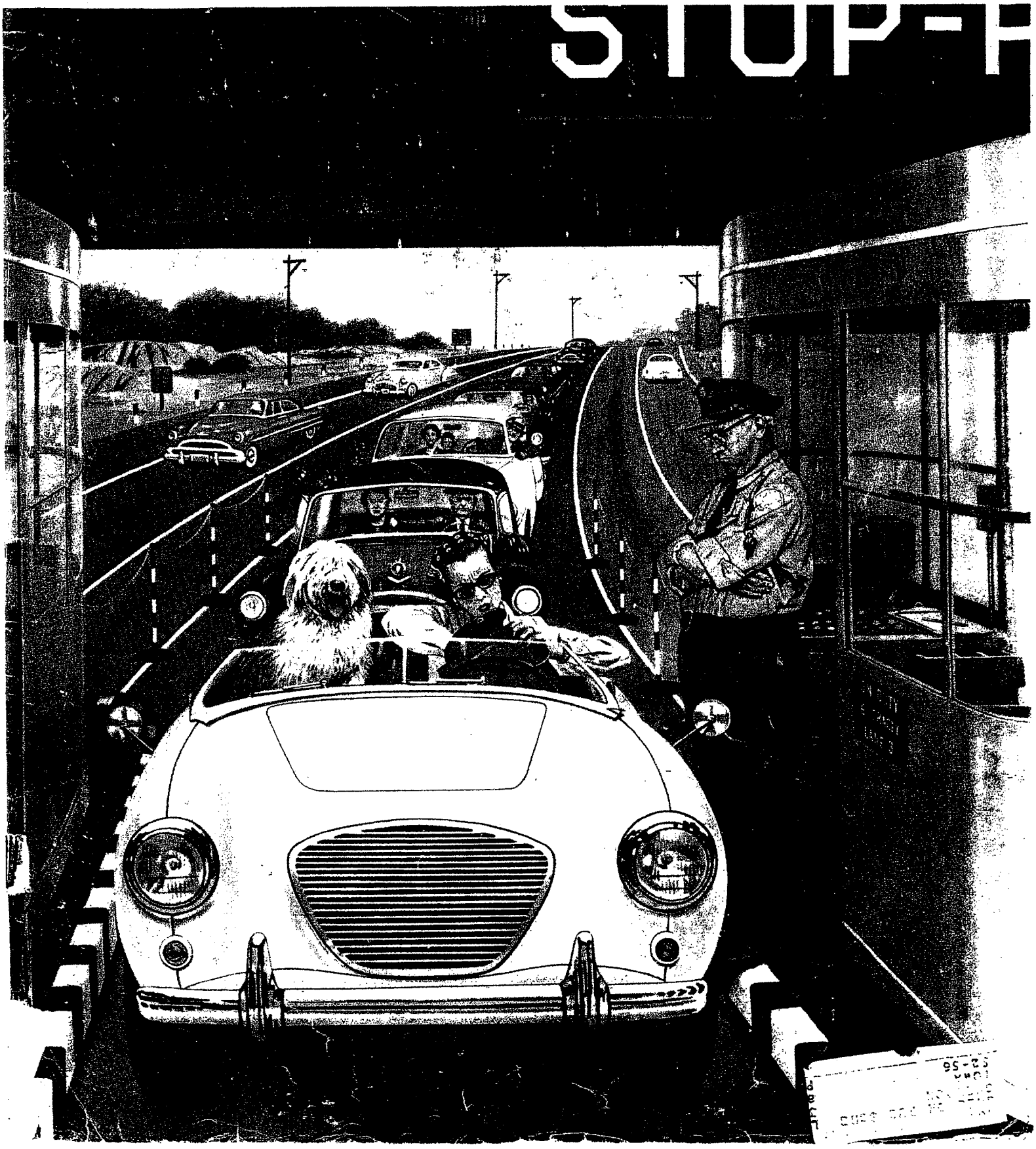
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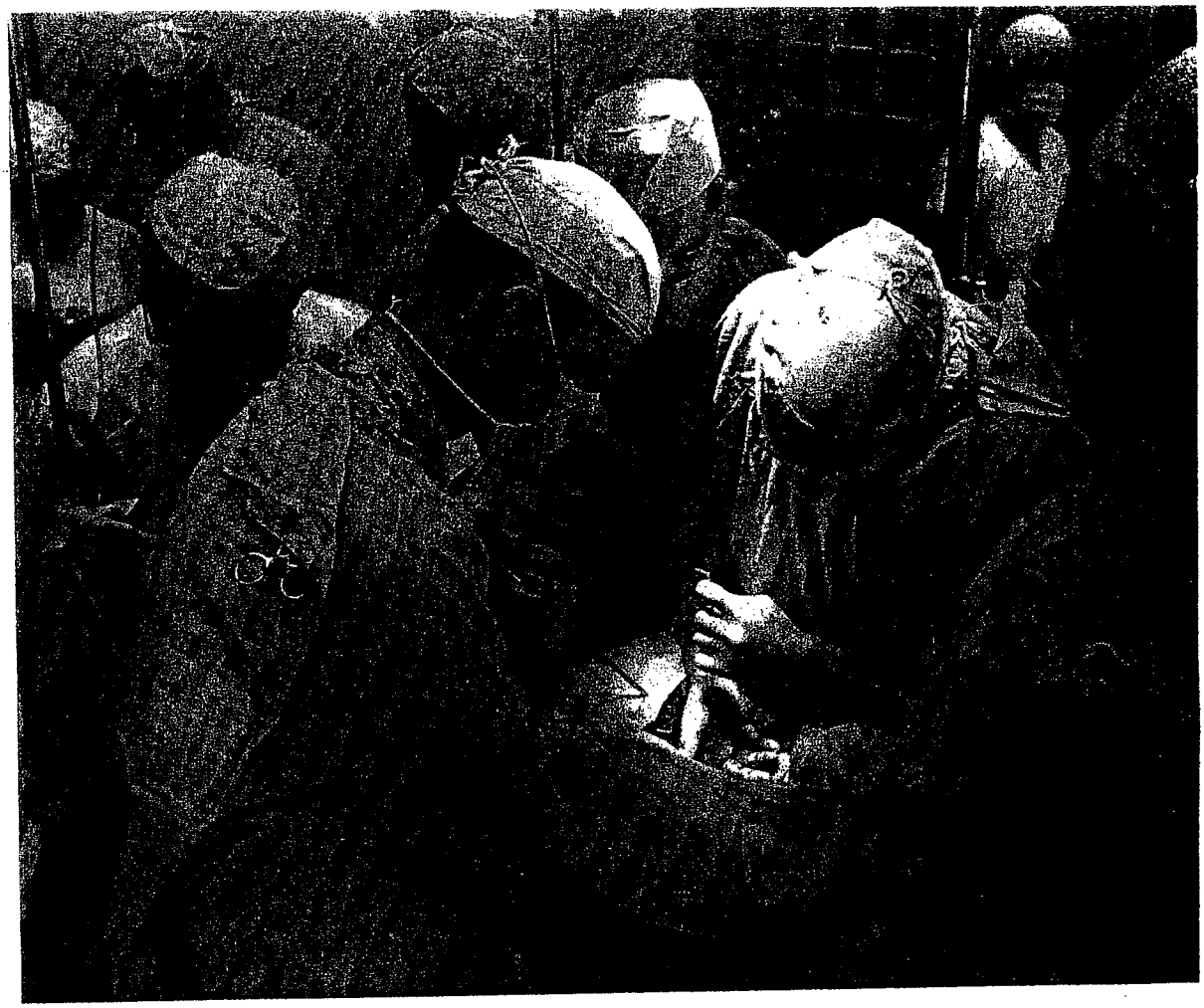
Sat. Evening Post
1952

The Saturday Evening
POST
April 7, 1956 — 15¢

RUSSIA'S UPPER-CLASS HIGH JINKS
By CHARLES W. THAYER

SURGERY FOR DAMAGED HEARTS
By STEVEN M. SPENCER





At Boston's Peter Bent Brigham Hospital, Dr. Dwight Harken slits open the constricted mitral valve of a damaged heart. This patient's affliction—mitral stenosis, or narrowing of the valve opening—is the most common heart condition presently treated by surgery.

They Repair Damaged Hearts

Today there is almost no kind of heart defect which surgeons cannot mend with a special knife and sewing needle.

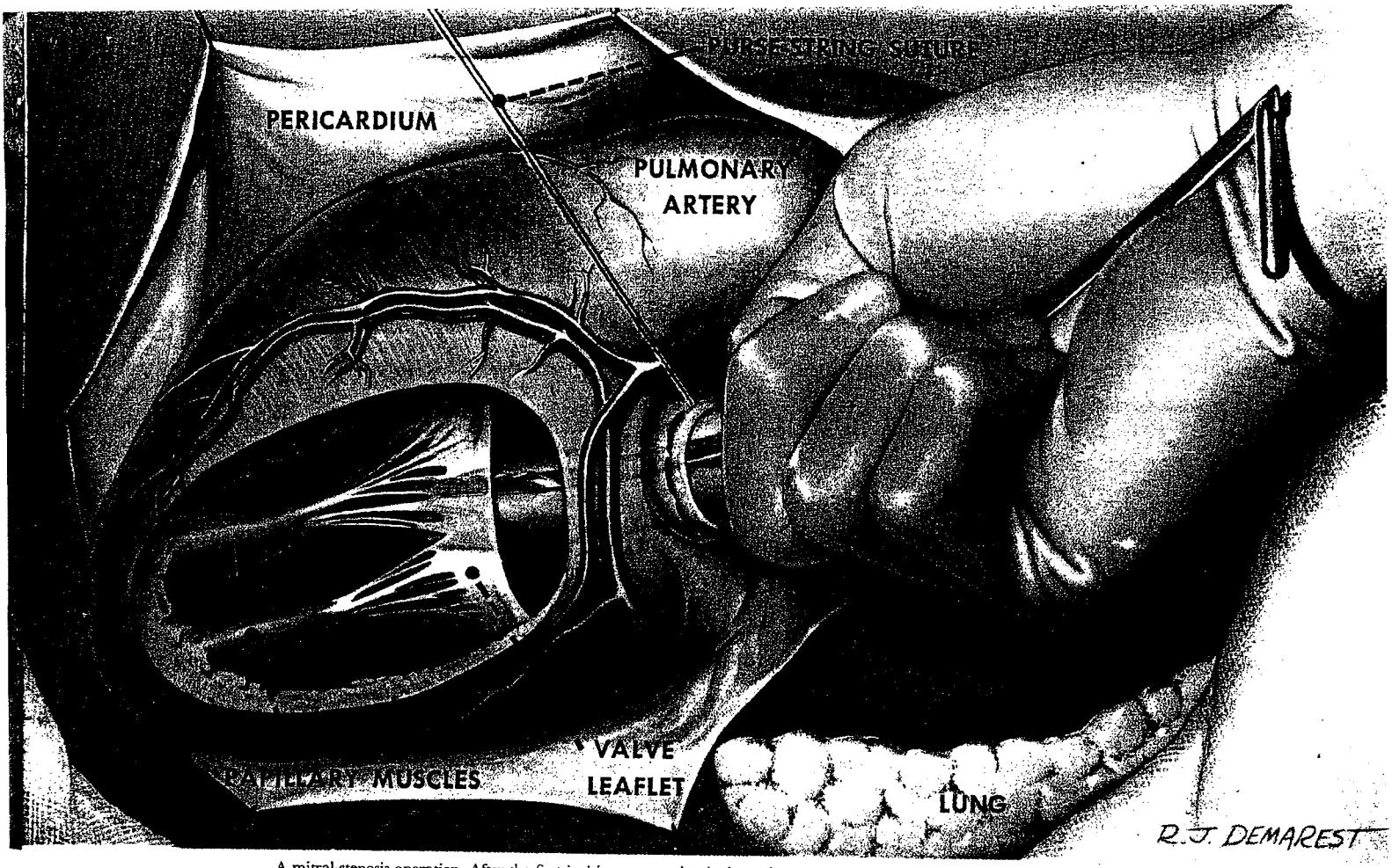
By Steven M. Spencer



Postoperative checkup: Dr. Charles Bailey, famous Philadelphia heart surgeon, finds Robert Ritter recovering successfully from an operation to correct a leaky mitral valve.

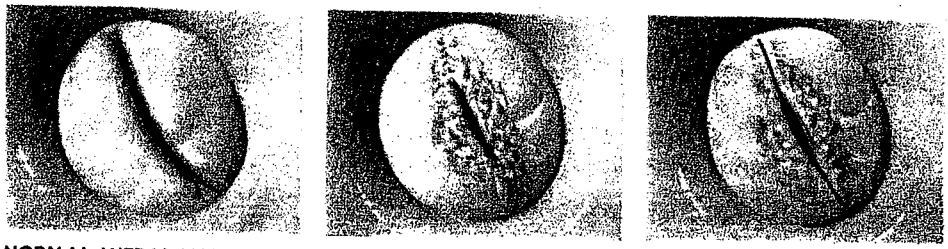


Dolly Tondo before surgery and, with Dr. Hugh Wilson, several months afterward. Boston specialists saved Dolly's life by patching up a hole in her heart.



A mitral-stenosis operation. After the first incisions are made, the heart is exposed by pushing aside the lung, slitting the pericardial sac and holding it open with several tie sutures. Then the surgeon widens the mitral valve with a knife attached to his finger.

The mitral valve (here seen from above) controls the passage of blood from one chamber of the heart to another. When this valve is constricted (center) it hinders circulation and restricts a person's activities. Surgery permits blood to flow normally again.



NORMAL MITRAL VALVE | STENOTIC MITRAL VALVE | AFTER VALVULOPLASTY

For centuries doctors hesitated to lay a finger, much less a knife or needle, upon the human heart. They were afraid their slightest touch would stop its life-sustaining beat. Even such a bold and skillful operator as the great Theodor Billroth, of Germany, warned in 1883 that "the surgeon who would attempt to suture a wound of the heart would lose the respect of his colleagues."

A few men did risk censure by sewing up an occasional stab wound in the forbidden organ. Beyond that, however, they dared not go. And in 1896 the British physician, Stephen Paget, concluded that heart surgery, elementary as it then was, had "probably reached the limit set by Nature to all surgery: no new method and no new discovery can overcome the natural difficulties that attend a wound of the heart."

Happily, Paget proved to be a poor prophet. But his attitude was typical of the mental block which, in the opinion of a present-day pioneer in heart surgery, Dr. Dwight E. Harken, of Boston, helped delay developments on this frontier for nearly half a century. Not until the 1940's did the barrier of skepticism and unreasonable fear begin to crumble. Scores of soldiers with bullets and shell fragments in their hearts forced the surgeon's hand. Doctor Harken, himself, as chief of the first Thoracic Surgical Center in the European Theater, located in England, extracted such hardware from within or around the hearts of 134 men in 1944 and 1945, without a single fatality.

Encouraged by success in removing these foreign bodies and in working on the large arteries and veins near the heart—as in the patent ductus operation of Dr. Robert Gross, of Boston, and the "blue baby" operation of Dr. Alfred Blalock, of Baltimore—surgeons moved on to more complicated repair jobs.

"We discovered that the heart wasn't such a mysterious and untouchable thing, after all," Doctor Harken remarked, referring to his own and other operations, "and that we could enter it, do things to it and get out again, if we just followed the rules of the game. One rule, for example, was to avoid turning or dislocating the heart from its normal position, since such manipulation could twist the great vessels, obstruct the outflow of blood and cause disturbances in the heartbeat."

By following the rules as they learned them, and by combining caution with a dash of boldness, the heart surgeons have written one of the most exciting chapters in modern medical history. Today there is almost no cardiac defect, congenital or acquired, which they have not corrected with their knife and sewing needle. And thousands of men, women and children, formerly doomed to invalidism or early death, are now going merrily about their work and play, supported by expertly mended hearts.

(Continued on Page 91)

(*Continued from Page 89*) Marxism which, I dare say, Marx would have found bewildering.

But suppose you've already bought a car, given your wife a mink coat, built yourself a country villa and insured your accumulated wealth, and still you have money rolling in from royalties or commissions? The Soviet Government launches each year a universal state 2 per cent loan, which will be deducted from your salary before you even see it. Your subscription to the loan is nonnegotiable and runs for twenty years, during which time it earns 2 per cent interest. In the past, you could subscribe as much of your salary as the party operatives could persuade you to give up. But the latter have now been forbidden to ask for more than two weeks of a comrade's salary. During my two months in Russia I found no one who had not "voluntarily" subscribed the full two weeks.

In addition to the 2 per cent, there is a 3 per cent loan which is known in local Soviet slang as the "gold loan." It has a lottery feature attached whereby you can win up to $25,000 in one of seven drawings. The loan is negotiable and you can buy and sell it in unlimited amounts in any bank. I asked a bank clerk why anyone in his right mind would invest in the 2 per cent loan when he could buy the 3 per cent.

"You don't understand," she said. "They are two entirely different things. One you buy and the other you subscribe to." But, I objected, if I had 10,000 rubles to subscribe or use to buy, there was no question in my capitalistic mind which I'd do. "But we subscribe to the two per cent because we want to help our government finance our industrial program," she explained. I dropped the subject.

There is one last way you can spend your extra income, as any parent in the world will tell you—on your children. The old communist tenet that the state would take over the bringing up of children has long since been discarded and the role of the parent has been re-emphasized. You may find it difficult to buy a car for your son, though it is occasionally done. You can, however, give him a country villa where he can entertain his friends and spend his vacations. If he is backward, you can provide tutors to help him get into college—college is a must for the well-to-do. Finally you can give him an allowance. Pocket money up to $250 a month is not unusual for children of the well-to-do.

But what can the children do with their allowances? There are movies and theaters. There is always the possibility of a little party at the country house, with plenty of liquor and girls. And then there are the bars of Moscow.

If the dreary, humdrum life in Russia is so dull that it drives adults to drink, it often drives the young people to even stronger solutions. The Soviet press is constantly ranting about "the excesses of youth." One newspaper even printed a gruesome tale of a band of six young men in search of something more exciting than a Soviet movie who planned a bank robbery. One of the boys threatened to snitch, and his body was found months later in a swamp outside Moscow. The plot was discovered and the boys sent to jail. Though the names of five were published in full, the name of the sixth was apparently too prominent for publication and was not printed.

In other respects immorality among the youth is causing headaches to parents and government alike. In 1936, during my first assignment to Russia, Stalin had prohibited abortions and the sale of contraceptives. But prohibition in this respect proved no more successful than prohibition of liquor in America. Abortions continued to be performed by unlicensed practitioners, resulting in frequent deaths. On my current visit, contraceptives were being sold at all drugstores, including the kiosk at Moscow University. Last December the government announced that due to the injurious effects of illegal abortions, their performance would once more be legalized.

One of the chief diversions of bored Soviet youth is to become a zoot-suiter, known in Soviet slang as "*stilyag*," or style-chaser. Their badge is long hair, narrow trousers, odd hats and bright-colored neckties. They can be seen any Saturday night walking up and down Gorki Street or in the Moskva Hotel Bar and nearby restaurants. The chic among them pretend to speak only Latin or English. They have rechristened the streets and sections of Moscow with such foreign names as "Broadway" (Gorki Street), "Piccadilly Circus" (Theater Square) and "Brooklyn" (the area across the Moskva River from the Kremlin).

The gilded youth of the well-to-do are by no means the pinnacle of the Soviet social structure. Far above them gyrates another galaxy known as the "Jet Set." These are the children of the very top communist leaders, marshals, composers and writers. Whereas the gilded youth number in the millions, the Jet Set is confined to a few score stars. The well-to-do count their fortunes in the thousands of rubles, but the Jet Set often has financial reserves into the millions. Some of them are orphans or widows of generals who lost their lives in World War II and have pensions amounting to as much as $1000 per family a month. But most of the money comes from royalties for musical and literary works or political tracts. When, for example, a leading communist makes a major speech, it is often distributed in millions of copies. From these he gets huge sums in royalties.

Income taxes are seldom more than 11 per cent and inheritance taxes are a flat 10 per cent. It is therefore possible for children of top leaders to inherit immense fortunes. This enables them to live in great luxury without lifting a finger. At least one such heir owns three country houses, keeps two apartments in Moscow and has four private cars. Asked how many millions he had, he replied, "Damned if I know."

The Jet Set are a class to themselves. They regard the gilded youth of the well-to-do as new-rich and vulgar. Not even all the offspring of the top leaders are accepted. For example, the Jet Set regards the children of Mikhail Pervukhin, member of Russia's highest ruling body, as "lowbrow," like their father. The Jet Set marry almost exclusively within their own circle and change marital partners with bewildering rapidity.

As for the masses, they simply do not exist for "the cream of the cream." The Jet Set crowd has no contact whatever with those who stand in lines. Even at the super-strict Moscow Grand Opera House, where, after performances, foreign ambassadors wait patiently in long lines at the cloakrooms, the Jet Set sweeps ahead and gets its mink coats, and no one raises a murmur. The public of Moscow is too well trained to object to such antics.

Money has no meaning for these new aristocrats. They think nothing of stopping at a flower shop on the way to a party and buying it out for their hostess. Their current craze is collecting old porcelain. Their greatest passion is for foreign things—from cars to phonograph records. They would give their shirts for a trip abroad. In summer the fashionable place for them to go is Carlsbad, in satellite Czechoslovakia. Foreigners who have seen Carlsbad since the communists took over deplore its decay. But for the Soviet upper crust it's the ultimate in spa luxury.

Whereas foreign ambassadors in Moscow sometimes have country villas to which they bring their servants when they come to stay, Jet Set members often have several villas, each permanently staffed with a full complement of servants. It is in these villas that much of their social life takes place, including, on occasion, some rather wild orgies. The legalization of abortions had no meaning for these spoiled sons of the great—they always found a doctor ready to perform the illegal operation.

Politically, the Jet Set is completely loyal to the Kremlin leadership. Occasionally, they bemoan the lack of a "strong man to make decisions," but they are well aware that they, too, have profited from Stalin's death, for that ruthless old man might at any moment have wiped the whole lot from the face of the earth with a single phone call. However, they take no part in active politics and regard themselves as superior to Communist Party activities. "Pravda is not for us," one of them said recently. "When it calls Tito a hero one day, a swine the next, and a great and good friend the third day—that may be for the masses, but it's not for us." Indeed, their belief in communism is the purest lip service. Enthusiasm for its teachings does not exist, and when someone tries to preach to them, they simply ridicule him with epithets.

A few of the males in the Jet Set are more serious and have studied for the diplomatic service or engineering, but for the rest, like the gilded youth they despise, their lives are a monotonous round of parties and boredom. Sometimes they enjoy doing bit pieces in the movies. This is considered quite the thing so long as it's not done for money. But the rest of their time they spend trying to wangle a trip abroad as the secretary of a delegation or a helper in some sports competition—anything for a look at Paris!

Why does the Kremlin put up with these new classes which threaten the very structure of communism? The answer, it seems to me, is that the Soviet system depends for its very life on its engineers, scientists and managers. To make sure of their loyalty, the Kremlin has bribed them with privileges which in turn are passed on to the children—the gilded youth and the Jet Set. The price the unthinking mass of Soviet workers are paying for their freedom from terror may well be high. But how high a price the communist rulers are paying in sacrificing some of their most basic principles is for the future alone to tell.

Editors' Note—Is communism, with its dreams of world conquest, here to stay? In his third and concluding article of this series, in next week's Post, Mr. Thayer has an informed and convincing answer to this question.

They Repair Damaged Hearts (Continued from Page 33)

Some have had abnormal openings between the right and left sides of the heart—septal defects—stitched shut. Others have had tight valves loosened up or have been equipped with plastic or cartilage baffles to make leaky valves close more tightly. In a few patients a gaping valve has been snugged up by a drawstring made of nylon parachute cloth or an eighty-two-pound-test fishline. Several people are wearing in their aortas, at the exit of the heart, a plastic ball valve that ticks away like the alarm clock swallowed by Captain Hook's dreaded crocodile.

The largest number of heart-surgery patients owe their new hold on life to a much simpler, but still delicate procedure. This is the one-finger operation—with or without a knife—designed to widen a mitral valve scarred and constricted by rheumatic fever. The valve, so-named because its two leaflets, when closed, resemble a bishop's hat, or miter, funnels the blood from the left auricle down into the left ventricle, whence it passes out to the aortic trunkline. Mitral stenosis—narrowing of the valve opening—is the most common heart condition presently treated by surgery. And the operation for it, perfected within the past eight years, has been basic to the development of the whole field of intracardiac surgery.

The procedure is now being carried out by excellent surgeons in many cities of the world, and important contributions to the technique have been made by a number of them. But credit for originating the operation and bringing it to its present high level of safety and usefulness belongs mainly to three men. One of them, Dr. Horace G. Smithy, Jr., of the Medical College of South Carolina, died in November, 1948, nine months after his first successful operation upon a mitral valve. The cause of his death—mitral stenosis. The two others are Dr. Charles P. Bailey, professor of thoracic surgery at Hahnemann Medical College, in Philadelphia, and Doctor Harken, surgeon at the Peter Bent Brigham Hospital, Boston, and associate professor of clinical surgery at Harvard.

As a boy of twelve, Doctor Bailey had seen his father die from the effects of mitral stenosis, and he determined early in his medical career to do something about the condition. Both he and Doctor Harken were born in 1910 and were in their thirties when they began research on the problem, arriving at solutions almost simultaneously. Their first successful mitral-stenosis operations were performed just six days apart in June, 1948—Doctor Bailey's on the tenth, at Hahnemann Hospital, and Doctor Harken's on the sixteenth, at the Boston City Hospital. Both of the first patients are still living and well. Associated with Doctor Bailey at this time were Dr. Robert P. Glover and Dr. Thomas J. E. O'Neill, who have also been responsible for many improvements in surgical methods.

Doctor Bailey and his associates inserted the index finger and a slender knife into the heart as the operating instruments, a modification of a technique described by a London surgeon, H. S. Souttar, some years before. Souttar had tried it in only one case, however. Doctor Bailey called his operation, a commissurotomy. Doctor Harken, in his first operations, which he called valvuloplasties, employed a punch-like instrument similar to those used by his famous predecessor in this field, the late Dr. Elliott Cutler, although he later changed to a finger-and-knife method.

The early triumphs of these pioneers were marred by frequent failures. A high proportion of the patients operated upon in 1948 and 1949 died during or soon after surgery. This period of dark discouragement was recalled by Sir Russell C. Brock, of London, in a speech last year before an international symposium on cardiovascular surgery at Henry Ford Hospital, Detroit. He and his associates at Guy's Hospital, at one point in their own development of mitral-valve surgery, had four successive deaths among their women patients.

"Despair stalked before us and everyone's morale was low," Sir Russell said. "I remember saying to my team that we could do only one of two things—give up or go on—that it was impossible to give up, as we were certainly in the right. The only thing, therefore, that we should do was to go on. We did continue, and had thirty consecutive successful cases."

While the courage of skillful surgeons was an important factor, the courage of desperately sick patients was no less essential to the forward march of cardiac surgery. Doctor Brock remarked at the Detroit meeting that he felt that "the great pressure to aid the development of mitral-valve surgery came not from the doctors, but from the patients, who, in their frustrated desires to obtain help in their disability, brooked no interference."

One who refused to wait for the slow uncoiling of medical conservatism and protocol, afraid her heart wouldn't last that long, is a dark-skinned, delicate-featured West Indian beauty named Dolly Tondo. Her trouble was a septal defect, a hole between the right and left auricles, rather than mitral stenosis, but her story dramatically illustrates Doctor Brock's point. For years she had tried in her native city of Port of Spain, Trinidad, to get help for her failing heart. Several years ago she journeyed to England, only to return disappointed. Then her local doctor got in touch with Doctor Harken and exchanged letters about her case.

But Mrs. Tondo became impatient with the pace of the mails. And one day last July she took the money she had earned from sewing lessons, left her seven-year-old son with her mother, and boarded a plane for the United States—without letting either physician know she was on the way. She felt she was dying and that this was her only chance. She landed in Florida and took a bus for Boston. Three days and nights later she arrived at the Park Square terminal in a state of collapse, too ill to call the doctor or the hospital. The bus driver made the calls, and a taxi rushed her to the Peter Bent Brigham Hospital, where she was placed in an oxygen tent and treated for heart failure.

There followed several weeks of study and tests and, early in August, Doctor Harken and his associates operated. They employed low-temperature anesthesia (hypothermia), chilling her body in an ice bath to reduce its metabolic need for blood. This permitted them to close off the vessels to the heart long enough to open the right auricle and stitch shut the hole in the heart's inner partition. She was then placed in a warming bath to bring her temperature back to normal. She made a good, albeit slow recovery, and two months after the operation left the hospital for a convalescent home. She has gained thirty-three pounds since the operation.

Surgery for mitral stenosis is considerably less risky and demanding than operations to correct septal defects like Dolly Tondo's. And as the surgeons learned more about the dynamics and pressure relationships of the heart and its valves their score with the scalpel improved. Dr. Frank Glenn, professor of surgery at Cornell, told a recent American College of Surgeons meeting in Philadelphia that the over-all mortality, as estimated from numerous 1955 reports, is now down to 5 per cent. "And the risk of operation is decreasing," he added. Doctor Harken reports that the figure for all but the very poorest risks—who constitute about a quarter of the entire group—is less than 1 per cent, which is no higher than that in the average abdominal operation. Indeed, the heart may in many instances be safer to operate upon than an inflamed or stone-filled gall bladder.

Doctor Harken classifies his mitral-stenosis patients into four groups, ranging from those without any significant symptoms (Group I)—for whom surgery is not usually recommended—to the cardiac invalids suffering chronic congestive failure (Group IV). The majority of patients accepted for surgery fall into a middle classification, Group III, described by Doctor Harken as having progressive symptoms, "so handicapping that their activities are significantly and increasingly limited." Of his first 500 mitral-surgery patients, 342 were in Group III. The surgical mortality among them improved steadily over the years from 14 per cent to less than 3 per cent. Since making this analysis of the first 500 Doctor Harken has operated upon several hundred more, and among the last 400 Group III patients there were only two operative deaths, a rate of one half of 1 per cent.

> A million years from now, the world may be filled with creatures who will stoutly deny that they ever descended from man.
>
> AL MCGEE

The figures on the poor-risk patients—those in Group IV—are less cheerful. Doctor Harken and Dr. Laurence B. Ellis, eminent Boston cardiologist who has supervised the follow-up analysis of these cases, point out in the journal, Circulation, that here the operative death rate, which covers those who die on the table or fail to rally in the postoperative period, has continued to remain at about 25 per cent.

"This emphasizes the desirability of operating upon mitral-disease patients before they reach this terminal stage," the Boston physicians state, although they believe people should not be operated upon "unless they are substantially disabled by their disease, and unless, in spite of medical treatment, they are going progressively downhill."

Even though the very-poor-risk patient may have only three out of four chances of recovering from his operation, this can be regarded as a worth-while gamble. For, as Doctor Harken says, they are "terminal cases, cardiac invalids." He calls attention to nineteen such patients who were accepted for mitral-valve surgery, but who at the last moment refused it. Seventeen of the nineteen were dead within one year.

Careful follow-up studies of the thousands who have survived the operation reveal that more than 70 per cent have shown striking improvement. This includes all groups, poor risk and good risk, although the percentage of good results has naturally been higher in the latter category.

The measure of improvement is sometimes dramatic, indeed. For Mrs. Doris McSweeney, a pretty, honey-haired young Boston housewife, it meant the final realization of hopes many times cruelly deferred. She had been one of thousands of women whose heart conditions were frustrating their efforts to have a baby. A heart hampered by a constricted mitral valve—and in some cases the opening is no larger than the head of a match—cannot pump blood through the body fast enough to take care of the woman's own normal activities. When it is forced to assume the additional burden of nourishing a developing infant in the womb, trouble frequently ensues. Four times the McSweeneys thought they were going to have a baby, and four times the young wife lost it before term. Their disappointment was bitter. When Doris became pregnant a fifth time her doctor talked to her about the possibility of terminating the pregnancy early in its course, for the sake of her own health. But the McSweeneys are Catholics. Their priest advised them that such action would not have the sanction of the church. In the meantime Doctor Harken had examined Doris and indicated she could probably undergo a mitral-stenosis operation even though she was pregnant.

"I wouldn't be able to live with my conscience, much less my religion," she told the surgeon, "if I didn't make one more effort at having a baby. So, if you think this operation will help me, I'm anxious to go through with it."

In the third month of her pregnancy, Doris McSweeney entered Mt. Auburn Hospital. There Doctor Harken performed the operation, widening the constricted valve to provide a more generous flow of blood for herself and her growing infant. Her physical condition began to improve almost at once. Last June, at the scheduled time, she entered the hospital again for the long-hoped-for event. And on the afternoon of June twenty-fifth Doctor Harken picked up the phone in his office to hear a young woman's excited and jubilant voice.

"Surprise! Surprise!" she shouted. "It's twins, doctor! Twins! I've really hit the jack pot!"

Today, chubby, blue-eyed Maureen and Michael McSweeney are among Doctor Harken's prize testimonials to the value of mitral-valve surgery. When their mother brings them to his office he picks one up in each arm and marches proudly around the place to show them off. They are not, however, the only babies whose advent into the world was made easier and more certain by an operation on their mother's heart. His list includes twenty other women operated upon while they were pregnant, with subsequent successful deliveries. One of these had triplets six months after her operation.

For some unknown reason, mitral stenosis affects more women than men, and its insidious course can lead to tragedies more serious than the inability to bear children. Although the condition is usually attributed to childhood attacks of rheumatic fever—often unrecognized at the time—it may not give its victim trouble until she is in her twenties or thirties. Then, as the obstructed valve interferes with the heart's blood pumping, the woman finds herself getting weaker and weaker. She cannot walk upstairs without panting for breath. She is tired out before her day's housework is scarcely begun. Her ankles may swell. As the disease becomes worse the back pressure in the blood vessels leading from the lungs into the heart causes fluid or whole blood to seep into the lung's air spaces. This is called pulmonary edema or congestion of the lungs. It often comes as an acute attack of gasping, wheezing and coughing of blood. These terrifying episodes are frequently brought on by unusual physical or emotional strain.

"The emotional ramifications of this condition," Doctor Harken commented, "often lead to the break-up of a marriage and a home. For sex relations may be hazardous if not impossible for the woman with severe mitral stenosis, and there are cases where the husband, failing to appreciate the seriousness of his wife's condition, has left her. If there are children, she is faced with the problem of providing for them alone. Because of her physical disability she may eventually be forced to place them in foster homes. She now feels completely deserted, her life ruined."

Doctor Harken is confident that cardiac surgery can prevent many of these domestic tragedies. And to his task of repairing damaged hearts he brings not only a sound surgical preparation but an unquenchable enthusiasm and an affection for his patients which obviously help in their recovery. His sense of humor is also on tap for those who are tense and worried about the ordeal they face. It is related that one woman, having been treated by various physicians and brought finally to the point of operation, looked at him anxiously and said, "Doctor, I'm now in your hands and God's hands."

To which Doctor Harken replied with a smile, "Well, I hope God scrubs."

Before he himself scrubs for the operation he orders the patient studied thoroughly to make sure her condition is one which he has a good chance of correcting. First come X rays and electrocardiograms. Then, in many cases, a fine plastic catheter is inserted into the heart chambers, via blood vessels in the arm, or through a hollow needle in the back, to measure pressures on either side of the defective valve. The pressure readings give a fairly reliable estimate of the size of the valve opening. At Peter Bent Brigham these studies are made by Dr. Lewis Dexter and his associates in the cardiac-research division. Once the patient is wheeled into the operating room she is in the hands not of one surgeon, but of four, plus two anesthesiologists and three nurses—a highly trained team of nine people.

Doctor Harken starts by marking out the line of the incision, a wide arc extending from the front of the chest around under the left breast and left shoulder blade. Then, with quick, sure strokes he cuts through the skin, fat and muscle. His assistants meanwhile tie off or cauterize the bleeding points.

The surgeons expose the heart by pushing aside the lung, slitting the pericardial sac and holding it open with several tie sutures. Now the heart can be seen clearly, pink and glistening and pulsating. Gently, without moving it from its normal position, Doctor Harken explores the organ and its attached great vessels.

Folded back on the main body of the heart is the earlike auricular appendage, the thin-walled tip of the left auricle. This is the vestibule through which the surgeon will enter the heart with his index finger to explore and operate upon the valve. To prepare for the crucial entry, the appendage is pinched shut near its base, by means of two curved clamps. Then purse-string sutures are stitched in place and a finger-sized slit made in the top of the appendage. As Doctor Harken slips his index finger into the slit, his assistants draw the purse strings snugly around it, meanwhile slowly releasing the clamps. The drawstrings keep blood from leaking out around the finger and the surgeon proceeds to probe the valve opening with his finger tip.

"This young woman has been very sick," he remarks. "She was terribly thin and pale and she couldn't go up three steps without becoming breathless. And no wonder. The valve opening is quite small—less than seven tenths of a square centimeter, I'd say."

He pauses to ask the anesthetist about the blood pressure. "Her heart's pretty irritable,"

(*Continued on Page 94*)

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he adds, as it speeds up momentarily. "We'll go slowly."

The surgeon is often asked, "Doesn't this motion of the heart bother you when you're operating?"

"Yes, of course it does," he replies. "But I'd be more bothered if it stopped."

On rare occasions a heart does stop during surgery, and then the doctor quickly grasps it in his hand and begins to squeeze it, as you'd squeeze a rubber ball, manually pumping the blood along, stroke after stroke. He may have to continue this for an hour or more before an invisible control center called the "pacemaker" takes over again. An electrical pacemaker devised by Dr. Paul M. Zoll, of Boston, may be employed, although nothing is quite so effective in this particular situation as the human hand.

In many instances the surgeon can widen the constricted valve with his finger alone—finger fracture, the technique is called. Doctor Harken opens it part way with his finger in this case and then calls for his "bread-knife valvulotome" to complete the task. This is a thin, flexible blade, a quarter of an inch wide, with a wavy edge and a flat shaft. He slides the instrument down flat along the surface of his finger, without removing the finger from the heart, rotates the blade ninety degrees to bring the cutting edge into position, and then moves finger and knife as one unit to slit the corners of the valve.

"I think I've given it about a four-square-centimeter opening now," he says. "This should be a good result. . . . How's her pressure?"

"It dropped to eighty," the anesthetist replies. "But it's going up again. . . . Ninety now."

"Fine. We'll come out. . . . Get ready with the clamps." He withdraws his finger enough for the assistants to clamp the lower part of the appendage shut, then pulls it out the rest of the way as they close up the slit with the purse-string sutures. The pouchlike appendage, now considered excess tissue, is snipped off just above the clamp and the opening at the base is sewed up permanently.

Not all operations go off as smoothly as the one just described. In many instances the edges of the valve leaflets are encrusted with calcium deposits. Extreme care must then be taken lest fragments become dislodged and sweep out of the heart into vessels leading to the brain. Here they could cause an embolism and temporary or permanent paralysis. Therefore, when the surgeon's finger warns him of calcifications he immediately orders an assistant to "hold the head vessels." Pinching these arteries shut for a few seconds will usually deflect any fragments into less critical parts of the circulation.

To make sure no paralyzing embolism has occurred, the patient, as she comes out of the anesthesia, is asked to say something and to move each arm and leg. The depth of anesthesia, by the way, is so managed that the patient is just rousing to consciousness as the surgeons finish with the sutures. At that strategic moment between sleeping and waking, Doctor Harken leans over the table and says, "You're doing fine. It's all over. Your heart's fixed. You're going to be all right." She opens her eyes drowsily, smiles and drops back to sleep. The nurses, specially trained in the care of heart-surgery patients, keep up this reassurance. The patient is thus given a good start on the road to psychological as well as physical recovery.

Reassurance, before and after surgery, is also supplied by members of the Mended Hearts, Inc., organized at Peter Bent Brigham Hospital and now numbering more than 1000 recovered heart-surgery patients scattered throughout the country. Wearing the club pin, a red heart with a neat seam stitched across the front, they call on patients only with the approval of the physician in charge, keep their visits short and cheerful, resisting the temptation to talk about their own operation in ether-drenched detail.

Addressing a group of fellow Mended Hearts recently on the fine art of hospital visiting, Mrs. M. Stanley Livingston, of Belmont, Massachusetts, said, "It is sufficient to point out that you can now walk around the block without huffing and puffing, whereas, before, you had to stop twice en route."

One Mended Heart went out and won a golf tournament after his operation. A New Hampshire housewife took a holiday trip to Pennsylvania with her husband—on a motorcycle.

To some of those who ask whether they can drive a car after the operation, Doctor Harken replies, "If you drove a car before, you can drive again. If you didn't, you'll have to take driving lessons."

Walter Abernathy, of Lynn, Massachusetts, a past president of Mended Hearts, Inc., was directing a traffic survey for the Massachusetts Department of Public Works the night we looked him up to ask about his operation. He had become a candidate for surgery, he said, not because his mitral valve was too tight, but because it had developed a bad leak. This incomplete closing of the valve is termed mitral insufficiency. So much blood flows backward into the auricle with each heartbeat that the patient suffers from extreme weakness, as well as lung symptoms. For nine months preceding the operation Mr. Abernathy was a semi-invalid, unable to walk across the room without leaning on his wife's arm or holding onto the walls and furniture.

Doctor Harken repaired Mr. Abernathy's leaky valve in December, 1952, by suspending horizontally across the opening a plastic plug two inches long and shaped like a soft-drink bottle. This "bottle baffle," as it is called, gave the otherwise gaping lips of the valve something to close on and prevented the hazardous regurgitation of blood.

A similar technique for plugging leaky valves was devised by Doctor Bailey in Philadelphia. Instead of using plastics, he carved the plug out of a piece of rib cartilage and covered it with a strip of pericardium. He applied this method not only to mitral valves but to the tricuspid—the corresponding valve in the right side of the heart—and to the aortic valve.

Neither Doctor Harken nor Doctor Bailey, however, has been satisfied with his score on these plugging maneuvers. They and other surgeons have been striving for more physiological approaches. Studying the anatomy of the valves, they found that a certain proportion of them fail to close properly because the fibrous ring or base of the valve, from which the flaplike leaflets grow out, has become stretched and dilated. In other words, the space is so large that the leaflets can't possibly meet at the middle to close it. Doctor Glover and Dr. Julio C. Davila, at the Presbyterian Hospital, Philadelphia, found they could reduce the size of the dilated mitral ring by encircling it with a heavy purse-string suture. The drawstring was then pulled together until the valve leaflets met properly.

The newest method of diminishing the size of a mitral-valve ring is that devised by Dr. Henry T. Nichols, an associate of Doctor Bailey's at Hahnemann Hospital and Medical College. Rather than attempting to encircle the entire ring, he pinches it together at two opposite points and holds these tucks with heavy eighty-two-pound-test fishline. The procedure is similar to reducing a worn and stretched buttonhole to normal size by taking stitches across either end.

As we stated at the outset of this article, no cardiac defect is beyond the reach of the modern heart surgeon. Some give him more trouble than others, of course, and one of the toughest is the aortic valve. It is the exit gate through which the powerful left ventricle discharges its full load of blood to start the journey around the body. Blood flows here at higher speed and pressure than anywhere else, and the surgeon cannot plunge his finger through a simple slit in the aorta without risk of uncontrollable and fatal bleeding. Nor is there any convenient appendage here to serve as an operating vestibule.

The surgeons are so sold on the "vestibule" principle, however, that they fashion an artificial appendage or cuff and sew it onto the side of the aorta. This provides a safe entrance for a finger or instrument during the aortic-stenosis operation. Some of the doctors get their wives to make the cuff out of a scrap of nylon or rayon slip. Doctor Bailey now prefers to use a piece of pericardium, obtained at post mortem and kept in a refrigerator. It is a thin, rubbery tissue and sewing it to a slit in the aorta, while a fold of the latter is pinched off with a clamp, is a slow, painstaking bit of needlework. But if properly attached it holds firm, without leaking, while the surgeon manipulates an instrument to cut open the fused valve leaflets.

The aortic valve that doesn't close properly is still a challenging problem. The plastic-ball valve developed by Dr. Charles A. Hufnagel, of Washington, has been one solution. But there are certain objections to it, and other methods are being tried.

Since this discussion has dealt only with surgery inside the heart we have said nothing about the various operations performed on the outer surface of the organ, aimed at increasing the blood supply to cardiac muscle impoverished by coronary-artery disease. A great many methods have been developed over the past twenty years, notably by Dr. Claude S. Beck, of Cleveland. Among them are the grafting of a chest muscle to the heart, the attachment of a chest artery to the coronary system, and the sprinkling of powdered bone or asbestos inside the pericardial sac to stimulate richly vascularized adhesions. The powdering procedure was suggested for President Eisenhower, but was voted down by his physicians, including Dr. Paul White, on the ground that his heart muscle was not so blood starved as to justify such an operation. Advances are steadily being made in this field, however, and the day may come when this commonest of all forms of heart disease, coronary thrombosis, may be relieved, in its more serious forms, by surgery.

The heart surgeons are also looking forward to the time when they will no longer have to do so many of their intracardiac operations by the sense of touch. "These are hidden-ball plays," one of them quipped, "and we would much rather see what we are doing." Help in this direction is coming fast from the developers of artificial heart-lung machines. According to a newly organized American Society for Artificial Internal Organs, four heart-lung machines were in use at the time of its first meeting last June. Others have come into operation since then. With the patient's circulation bypassed through an apparatus that will pump and oxygenate the blood, the surgeon can work in an open and dry heart for an hour or so at a time. Given this advantage, the possibilities for reconstructing damaged hearts are almost limitless.

THE END