Washington University Magazine, Summer 1968

Follow this and additional works at: https://digitalcommons.wustl.edu/ad_wumag

Recommended Citation

This Article is brought to you for free and open access by the Washington University Publications at Digital Commons@Becker. It has been accepted for inclusion in Washington University Magazine by an authorized administrator of Digital Commons@Becker. For more information, please contact engeszer@wustl.edu.
SECRETARY OF Defense Clark Clifford was among the many hundreds of alumni who returned to Washington University during Commencement Week. Secretary Clifford, LLB 28, flying in to attend the reunion dinner of Law School alumni, met with old friends, hashed over memories of campus days, and displayed as the chief speaker remarkable talents as a wit, raconteur, and impromptu stand-up comedian.

In his remarks, Clifford regaled the crowd with reminiscences drawn from both his life on the Washington University campus and on the Washington, D.C., political and social scene.

Clifford's classmates remember him as an outstanding tennis player and as a dashing actor-singer who starred in various Thyrsus and Quad Show productions and headed the Glee Club. They also remember him as an even more outstanding practical joker and prankster. That last reputation, the Secretary of Defense admitted, is richly deserved.
WASHINGTON UNIVERSITY Magazine

SUMMER 1968
Vol. 38, No. 4

Editor
FRANK O'BRIEN

Assistant Editor
JIM PATTERSON

Associate Editor
and Photographer
HERB WEITMAN

Science Editor
ROGER SIGNOR

Designer
PETER GEIST

COVER: Fox and friend. Professor Michael Fox and a wolf cub, one of the subjects of his research in the field of ethology. See "The Ethologists and the Naked Apes," pages 40 to 43.

The Colonel's Ladies 2 Prince of Schilling Manor

Can a Party Dump an Incumbent President? 10 A political historian examines the question

The Flying Barndoor 15 Hunting heavy particles in cosmic rays

Forty Thousand Miles Under the Sea 18 An alumni cablegram

Abortion 22 Perspective on a medical-legal-ethical issue

The Graduates 28 Profiles of four graduate student couples

Teaching in Tradition 34 Three R's to four grades in one room

The Ethologists and the Naked Apes 40 Fox on foxes and other species

Grand Prix d'Architecture 44 The Great Race

Photo Credits: Pages 15-17, John Millaire; 16-21, AT&T Long Lines; 44-47, Herb Weitman, Jim Patterson; inside back, Lemoyne Coates; all others, Weitman.

Washington University Magazine is published quarterly by Washington University at 1201-05 Bluff Street, Fulton, Missouri 65251. Second-class postage paid at Fulton, Missouri.
THE COLONEL'S LADIES

By DOROTHY BROCKHOFF

Office of Information

Schilling Manor sounds as British as tea and crumpets—and it conjures up all sorts of grand images. One could quite easily imagine it the baronial estate of one of those squires who advertise so faithfully in the classified section of Town and Country, or, just as logically, the inspired creation of a developer of prestigious suburbia.

Instead it is the name of one of the most unusual communities in all of America. Located two miles south of Salina in the Kansas heartland, Schilling Manor is a sub-post of Fort Riley. But up and down the short streets lined with single-story duplexes and one-family ranch houses, one seldom sees a uniform. Indeed, one seldom sees a man, for the 3000 persons who live here are nearly all women and children.

These are the dependents of career military personnel serving overseas. According to military terminology, their husbands and fathers are away on "unaccompanied tours of duty," which means that they are in places where families can't follow—the majority in Vietnam.

At mid-morning on a sweet spring day, the full impact of what it is like to live in such a matriarchal society is not, at first, apparent. From a distance, the 735 "Cape-harts," named after a former United States Senator from Indiana, seem no different from hundreds of other houses which dot the prairie landscape. Only when you begin to look more closely do you notice the little things that distinguish Schilling Manor from its suburban counterparts.

The grass, laced with saffron dandelion, is everywhere the same height. At Schilling Manor a contractor mows all the lawns, for the fathers aren't around to do the job. There are not many trees, but here and there a sapling bends in the wind which sweeps ceaselessly across the broad flatland. The visitor often sees, propped against one of these young oaks or maples, cartons piled high by movers emptying a hulking moving van. Such trucks lumber into Schilling Manor nearly every day, for the occupants of this community come and go like gypsies.

The average "waiting wife" is a Schilling Manor resident for about a year—the usual length of time her husband serves overseas. For some the days go very fast, for others—the ones who are loneliest—they drag.

It is the latter who is of most concern to Lieutenant Colonel Roy C. Prince, director of community services at Schilling Manor. A career Army officer who is also a trained psychiatric social worker, he holds two degrees from the George Warren Brown School of Social Work at Washington University.

On some musty shelf in the Pentagon archives, the Army undoubtedly has a proper description of precisely what it is that Colonel Prince does. But no matter how conscientious the personnel officer was who prepared the text, he couldn't possibly have encompassed the all-embracing nature of Colonel Prince's work, for almost every hour brings some new crisis for him to handle.

On a day which finds him at 7:30 in the morning at his desk in a windowless office tucked away in a corner of the Community Center, Colonel Prince may be asked to do everything from settling a neighborhood squabble to rescuing a small child treed in a sycamore. Sandwiched between these tasks are private counseling sessions with harried mothers, meetings with the officers of the Waiting Wives Club, and the handling of reams of paperwork.

The tempo lessens a bit when the Colonel goes home, but because he lives at Schilling Manor, he is easily available after hours. And the ladies, as Colonel Prince always calls the wives, know this. At twilight, as he and his wife, Nancy, and two children are at dinner, a pair of young matrons with a problem will ring his doorbell. Still others will call him up at two or three in the morning for advice, and not long ago one woman riding by in the post bus spotted him in the garden, asked the driver to wait, and received what he calls "curbstone counseling."

The pace is quick and it is relentless—but somehow Colonel Prince gives no hint of the pressures that bear...
Lieut. Col. Roy C. Prince holds two degrees from Washington University and one of the most unusual jobs in the armed forces. He is director of community services at a Kansas post where some 3000 women and children, the dependents of career military men serving overseas, live while waiting for "dad" to complete his tour of duty in places where they can't follow.

Lieut. Col. Roy C. Prince is a "Pied Piper" with children. In a classroom young admirers compete for his attention.
Colonel Prince counsels one of the "waiting wives." Friendly, patient, and compassionate, he has a rare understanding of human beings and their problems which enables him to establish rapport with them.

A child shyly clasps the Colonel's hand. Such gestures of trust are common at Schilling Manor where the ladies and their offspring depend upon him for guidance.

Lee Mundt (right), president of the "Waiting Wives" Club, chats with a neighbor who has just done the family wash.
she nor anybody else at Schilling Manor seemed to think
can do just about anything. One little fellow was so im­
of men representing all five branche s of the armed forces ,' Prince to ask a favor, for he has a very special way with
visit are una wed by this giant in the dark green unuonn
him—for this man quite obviously have to tell the Colonel is aU that matters to him. And
with all the gold braid, for they know him as a friend.
pressed with the Colonel that he confidently phoned him
Schilling Manor.
Small hands reach out to clasp his as he crouches on the
floor, and for the moment, at least, what these children
Colonel Prince observed, noting proudly that just recently
are some 650 waiting wives and 2300 children, 1100 of
pertaining to the place. I can feel with them but not for them to
the extent that it impairs my ability to help. I have to re­
main calm and stable. I can't panic, for there's enough poten­tial
potential for that here already. If I can't deal with a prob­
blem reasonably and take it in my stride then I'm not set­
going a good example for others—the people who work
with me and those we're trying to serve.
Those whom Colonel Prince and his staff of nine assist
are some 650 waiting wives and 2300 children, 1100 of
them of elementary school age. These are the dependents
of men representing all five branches of the armed forces,
Colonel Prince observed, noting proudly that just recently
the family of a member of the Coast Guard moved to
Schilling Manor.
For many of the small fry on the post, Colonel Prince
is a combination substitute father and a Superman who
can do just about anything. One little fellow was so im­
pressed with the Colonel that he confidently phoned him
one day and implored, "Please bring my daddy home."
It was a waiting wife who told this story, but neither
she nor anybody else at Schilling Manor seemed to think
it extraordinary that a young boy should call up Colonel
Prince to ask a favor, for he has a very special way with
children. A tall, rangy man with not an extra pound on
his six-foot-three frame, the Colonel is a towering figure
as he strides down a hall and into a classroom.
For many of the small fry on the post, Colonel Prince
is a combination substitute father and a Superman who
can do just about anything. One little fellow was so im­
pressed with the Colonel that he confidently phoned him
one day and implored, "Please bring my daddy home."

 Colonel Prince has been keeping tab on Eddie and
all the other dependents at Schilling Manor since the
fall of 1966, when he was ordered there from the Brooke
Army Field Service School at Fort Sam Houston, Texas,
where he had been teaching social work for two years. At
the time, he had never heard of Schilling Manor and
neither had many other people, for it had been in existence
for only a few months. It was in January, 1966, that the
Department of Defense officially decided to retain the
housing area which had been part of Schilling Air Force
Base, closed the previous June, and turned it over to the
Army for use as a haven for waiting wives and their off­
spring.

"I approached the job with a lot of trepidation," Colonel
Prince reminisced, "because I really had no idea what it
would be like. Essentially, it's a manless community, and
very different from any place I had ever been assigned in
my seventeen years as an Army officer. It is the only place
of its kind operated by the military which provides the
services that the dependents would normally get if they
resided on a regular active military post. As such, it is
unique in the United States, and I suspect in the world."

The neat homes, which have two to four bedrooms, are
administered by the subpost commander, Major William C.
Coate, and his staff. The families at the post, which are almost three to one those of enlisted personnel, forfeit their housing allowance when they move into Schilling Manor. "What this means," Colonel Prince carefully explained, "is that the ladies turn over their housing allotment to the government in exchange for living quarters here. In other words, they pay rent ranging from $105 to about $165 a month depending on their husband's rank. Add to that the thirty dollars separation allowance which families of servicemen serving overseas living in civilian housing receive, and which these ladies also forfeit. The total is an accurate figure of what it costs a family here."

Misunderstanding about this point has caused Colonel Prince and his waiting wives much grief, for it has been erroneously reported elsewhere that the families at Schilling Manor live there free. "Nothing makes the ladies angrier than to read such reports," Colonel Prince emphasized, "for they aren't looking for something for nothing." In exchange for the fees they pay, they get utilities and maintenance services. Moreover, the post offers a dispensary staffed by three doctors and two dentists, a post exchange, commissary, theater, swimming pools, chapel, tennis courts, a community center, and two government-built elementary schools within walking distance.

Both Colonel Prince and the overwhelming majority of waiting wives are enthusiastic about the Schilling Manor experiment. "I can think of no better expression of humanitarian concern that the military has for the families of servicemen as well as the servicemen themselves," he says.

The ladies express their feelings less formally. Red-haired Ann White, the mother of five children and the wife of Major Richard E. White, an Army adviser to the Vietnamese, said: "Our associations have been with the military for so long that we just want to be together. There's an understanding here of each other's troubles. Perhaps you can't solve your neighbor's problem, but you can probably help her to see the funny side of it. Sometimes that saves you both, you might say."

A young German emigrant, Barbara Ware, the wife of a West Pointer, Lieut. Colonel Fletcher Ware, serving with the First Cavalry Division at Hue, agreed. "We have our lonely moments but then on the other side we have the women who are in the same boat, so that you really are never alone with your problems. You can go next door to a nice neighbor and cry if you feel like it. She'll understand and she'll help you."

Reporters meeting the Schilling Manor wives for the first time, and there have been many including television commentators from as far away as Germany, always want to know why the women don't go back to their parents or in-laws while their husbands are overseas. They have a ready answer.

Perhaps Lee Mundt, the wife of Major James A. Mundt, a judge advocate, also with the First Cavalry, put it best. "If you go back home you feel like a fifth wheel. I tried that when my husband was gone before and it didn't work. I think if I had attempted it this time I'd have lost my mind. You have both sets of parents worrying. It's too hard on the wife and the kids. This way there are no fathers around for any of them and they accept this fact. But if everybody else's daddy comes home at five o'clock, then the little ones particularly want to know why their father can't do the same thing. It's no good. That's why I think Schilling Manor is the greatest thing they ever did."

Ann White observed: "Two families under the same roof just doesn't work. Once you've had your own home and your own family—it's hard to relinquish even part of this."

These women, however, have a choice. For many, including most of the 40 percent who are foreign-born, returning to their homeland is a physical impossibility. Schilling Manor is truly a blessing for them. Tiny, fragile Sakiko Hayes from Tokyo, the mother of five children, struggled to express her gratitude. "My husband did everything until he went overseas. He paid the bills (I never wrote a check), and even took the children to the dispensary. Now I have to do everything and it was so hard at first I nearly went mad. But, at least here, there are people to help me. If something happens to the electricity or the plumbing, I just give them a call and they fix it. This is the best way." Her husband is Austin Hayes, a technical sergeant with the Air Force in Saigon.

No one, of course, claims that life at Schilling Manor is idyllic. In addition to the loneliness, there is an understandable tension that permeates the community. "Because of this anxiety," Colonel Prince explained, "little problems which ordinarily would disappear tend to become magnified. That's what you have to remember and try to evaluate at Schilling Manor. You have to decide how much of the problem is real in terms of its locus being at Schilling Manor and how much is associated with the relationship that is now ruptured between husband and wife."

He continued: "It's not easy being both father and mother. How to discipline the kids is a major concern. Many of the ladies get terribly upset because they can't seem to make an older son mind. When the boy did something wrong before, the father always took care of it."

"You have to remember," he cautioned, "that at Schilling Manor we have tremendous differences in cultural and national backgrounds. This, coupled with the natural concern over dad, can create a potential for lots of difficulties. Fortunately, most of our ladies can cope with them, but there are some that don't have the experience and the strength to grapple with certain problems that arise. For these few, we are available at any time."

Quite a large group of the women manage to live with
Trudging home from one of the two schools on the Schilling Manor grounds, a group of children are silhouetted against the flat Kansas landscape which in the spring looms large as a sea of grass.

Mrs. Austin J. Hayes, the Tokyo-born wife of a technical sergeant in Saigon, says: "It's so hard without husbands—really hard."

Keeping fit is a major concern of the Schilling Manor ladies. Many of them take part in exercise classes, one of many activities arranged for the waiting wives to help ease their loneliness.
Mrs. Herbert L. Clark, holding the two smallest children, is the petite mother of eleven offspring. Her husband is an Army platoon sergeant now serving in Saigon.

The wife of a major serving as a judge advocate with the First Cavalry Division at Hue, Lee Mundt helped put together a 400-recipe “Waiting Wives Cookbook.”
their fears by keeping so busy that they simply don't have time to think about them. And there is plenty to do at Schilling Manor. Colonel Prince and his staff see to that. Women can learn to do anything from decorating cakes to repairing ailing automobiles. Much of this activity is sponsored by the Waiting Wives Club which this year is headed by energetic Lee Mundt. "It's the people who sit at home and don’t participate who have the hardest time," she said, "If they get out and meet their neighbors and make some friends they don't feel nearly so bad."

Colonel Prince agrees and he thinks this philosophy also applies to the children. For this reason, he encourages all sorts of Scouting activities and urges youngsters to sign up for the softball and baseball teams. Last year the Little Leaguers had to play their games at downtown parks, but this summer thanks to help from Salina and Fort Riley volunteers, there are three new baseball diamonds at Schilling Manor.

The promotion of such projects is one of Colonel Prince’s chief concerns. “One of my major responsibilities,” he maintains, “is to try and establish resources where they don’t exist and to coordinate those that we do have. Those baseball diamonds are a good example. We really needed them—to see such needs being met is gratifying.”

That Salina residents helped develop these new fields is especially pleasing to Colonel Prince, for when the waiting wives first came to Schilling Manor there was much misunderstanding about them not only in the town itself, but for miles around. Some of the confusion had its humorous side. The colonel likes to tell the story of the old Nebraska farmer. Hearing that there was a Waiting Wives Club at Schilling Manor, he climbed in his pick-up and headed straight for the post under the mistaken impression that he could find himself a wife.

But not all the uncertainty about the new residents at Schilling Manor was merely misguided. Primly proper Mrs. Grundy’s wondered out loud whether some of the waiting wives might not be tempted to drink too much or take men home with them. Bad jokes even sprang up about the “willing” wives. “But,” says Colonel Prince, “deviant social behavior is less of a problem here than in any comparable community. That’s because we have built-in social control. With their husbands away and time on their hands, the ladies pay more attention to their neighbors than they would ordinarily.”

“The overwhelming majority of our ladies,” he added, “are really tremendous. They lead quiet, orderly lives, join in many of the activities here at Schilling Manor, and contribute a great deal to the community life of downtown Salina.” As for the waiting wives themselves, most of them seem to admire the Colonel as much as he respects them.

“Fabulous,” is the way he’s most often described. That he should be so widely admired surprises Colonel Prince, who says almost wistfully, “I would like everybody to feel favorably toward me, but that is a goal I’ll never achieve.”

The consensus, however, seems to be that he’s closer to his aim than he suspects.

Of his success, Colonel Prince says little. He does admit, however, that his job at Schilling Manor is “the most satisfying of my entire career.” And that’s quite a statement for a man who has served his country almost continuously since he dropped out of high school in December, 1942, to join the Navy. While serving in that branch of the armed forces, young Prince, who eventually became a yeoman, first class, observed that “there seemed to be some race or nationality requirements for certain jobs in the Navy” and this fact bothered him.

It disturbed him so much that after the war when he was in the middle of his studies in business administration at Drake University, he decided to switch to social work. “That’s one decision that I’ve never regretted,” Colonel Prince declared. “I thought that if I went into that profession I could do as much as any one individual can about racial bias.”

Colonel Prince earned his undergraduate degree in 1950, and then completed his studies for a graduate degree in social work at Washington University a year later. Shortly after, he became a second lieutenant in the Army and a military social worker because, as he puts it, “I felt that if I could apply what I had learned in college through government service that would be the thing to do since all my education past high school had been on the GI Bill.”

Over the years he’s held some highly responsible jobs, including chief of social work service at the Army mental hygiene clinic in Hawaii, the position he left in 1959 to begin his doctoral studies. After two years of residency at Washington University, he was reassigned to Fort Sam Houston and then, after five years he was ordered to Schilling Manor. Meanwhile, he’s continued, as he puts it, to work off and on for his Doctor of Social Work degree awarded him at commencement this June.

It’s been quite a struggle, the Colonel admits, especially since he’s had to finish his dissertation while working practically around the clock at his job.

“Some people don’t take work home with them—I do,” he says matter-of-factly. “For me it’s difficult to forget some of the problems that human beings have.” It’s this very deep concern which people sense in Colonel Prince. Such compassion is rare, but even rarer is the compliment one waiting wife recently paid him and his work. Groping for words to express her appreciation, she said simply, “Colonel Prince is a wonderful man. I’m very happy we came to Schilling Manor, and if it’s ever necessary for us to come here again, I’ll do it gladly.” That tribute from a normally reserved Bostonian was the very nicest graduation present that Colonel Prince (now Doctor of Social Work) received.
"Was he pushed or did he jump?" Professor Chambers asks about Lyndon Johnson's withdrawal from the 1968 Presidential race. In this article, Dr. Chambers, a political historian whose work on American party politics has won wide acclaim, discusses some pertinent precedents.

CAN A PARTY DUMP AN INCUMBENT PRESIDENT?

By WILLIAM NISBET CHAMBERS
Edward Mallinckrodt Distinguished University Professor

In the early stages of the "Dump Johnson" movement, the conventional wisdom said that it couldn't be done, and that the party that tried it would suffer at the hands of the voters. Even in the depths of the Great Depression in 1932, the pundits argued, the Republicans knew they had to stick with Herbert Hoover although a few leaders did talk briefly of replacing him with Calvin Coolidge.

In fact our forty-five presidential elections before 1968 show ten attempts, all told, to deny renomination to an incumbent President. Excluding the virtually uncontested triumphs of George Washington in 1789 and 1792 and of James Monroe in 1820, the count comes to nearly one in four contests in which such attempts have been made. Some of the intended victims were obscure, but the list includes figures as weighty as Abraham Lincoln and Harry S. Truman.

History is not a handbook for politicians, but a look at the record of the past may supply some answers to the conventional wisdom and put the events of our own times in perspective.

The earliest foray came in 1800, against the second President and in the second contested election. The target was John Adams of Massachusetts, a moderate Federalist whose aloof, self-righteous ways had offended many of his fellow partisans.

As chief executive Adams faced the divisive problems of an undeclared naval war with France. One horn in
his side was the brilliant Alexander Hamilton, who in effect led a "hawkish" Federalist faction. When Adams chose to seek an end to the war through negotiations, the enraged Hamiltonians determined to drop him. There was no national convention then, but Federalist members of Congress did hold a nominating caucus in the spring of 1800. Yet when the showdown came, even the Hamiltonians supported Adams and General Charles Cotesworth Pinckney of South Carolina as his presumed running mate, in part because they found that Adams had more popular support than they had anticipated.

But Hamilton had another second-line strategy in mind that was possible under the electoral system of the time. This was to arrange the Federalist electoral vote so that Pinckney would be named President while the hated Adams was demoted to the vice-presidency. This strategy failed too, but in the end Adams lost out to Thomas Jefferson in a close contest, while his party lost both houses of Congress.

Vice Presidents who took office on the death of Presidents in the next hundred years appear to have been particularly vulnerable to attack. All four Vice-Presidential successors in the nineteenth century were shunted aside by party conventions, which became standard from 1832 on. Two of these four lost their chances for renomination after they broke with the parties that made them Vice President.

The first such victim was John Tyler of Virginia, a former Democrat turned Whig. The convention politicians who made him William Henry Harrison's running mate in 1840 were simply trying to balance the ticket by matching "Tippecanoe" Harrison from the North with "Tyler Too" from the South. The strategy worked. When the compliant Harrison died a month after he took office, Tyler, always somewhat stiff and unbending, proceeded to veto bill after bill sent up by a Congress dominated by the dashing Whig hero Henry Clay and was in effect read out of the party. Although he fished for the Democratic nomination and then for a nomination by his own political dependents, nothing could save him. He found himself a political outcast.

The Whigs went on to name Clay for 1844, but he lost in a close contest to James K. Polk, the Democratic nominee and first "dark horse." The Democrats also carried both houses of Congress.

The story was more dramatic for Andrew Johnson of Tennessee. Also a former Democrat, he was a man of little education, often tactless, an obscure tailor before he made his way up the political ladder. In another ticket-balancing act, he was slated for the vice presidency by the "Union"-Republican convention of 1864 along with Abraham Lincoln. After Lincoln was assassinated, Johnson as President found himself on a collision course with the dominant Radical Republicans in Congress over issues of Reconstruction and Negro rights in the vanquished South. He, too, fought back, although he hardly helped his cause when he often appeared to be drunk in the course of a stump tour in 1866.

When Johnson removed the Radical Republican plotter Edwin M. Stanton from his cabinet in early 1868, the Radical forces in Congress immediately brought impeachment charges and almost succeeded in getting a conviction. Obviously, Johnson had lost any chance he might have had for the Republican nomination. Like Tyler, the tailor in the White House wooed the Democrats, but the suit was hopeless. The Republicans nominated the Civil War hero Ulysses S. Grant and swept the Presidential and Congressional contests.

The descent into oblivion of two other vice-presidential successors, Millard Fillmore and Chester Alan Arthur, perhaps was suitable. Most Americans today can scarcely remember who they were.

A journeyman politician from New York, as bland as he was handsome, Fillmore became President when Zachary Taylor died in 1850. He offended anti-slavery leaders in the Whig party, and some Southern extremists too, when he supported a set of slavery-compromise proposals Henry Clay had sponsored in Congress. In addition many Whig politicos, remembering their triumphs with military heroes like "Old Tippecanoe" Harrison in 1840 and "Old Rough and Ready" Taylor in 1848, thought they had a more "available" candidate. With the Northern wing of the party they backed the latest man on a white horse, "Old Fuss and Feathers," General Winfield Scott. After fifty-three convention ballots Fillmore was shunted aside, but Scott fell before the Democratic entry, Franklin Pierce, and the Whigs also lost the House and Senate.

Nearly thirty years later in 1881, when James A. Garfield was shot by a disgruntled office-seeker, his successor was Chester Arthur. Loyal, easy-going, dignified, Arthur had also climbed the spoils ladder in the Empire State. He was slated for the vice-presidency in 1880 to balance the books between Republican "Stalwarts" and "Half-breeds," so named for their loyalty or opposition to General Grant and his following. Garfield was a Halfbreed, Arthur a Stalwart.

As President, Arthur surprised everyone by supporting civil service reform. This strange course soured the spoilees on him, and he was also caught in the continuing squeeze between Stalwarts and Halfbreeds. On the fourth ballot at the Republican convention of 1884, Arthur fell to James G. Blaine of Maine, the brilliant but corrupt "Plumed Knight" of the Halfbreed phalanx. In the election, the Democrat Grover Cleveland eked out a victory by three-tenths of one per cent of the popular vote, and the two parties divided control in Congress.

Meanwhile, three attempts had been launched to sidetrack Presidents who had been elected on their own. In all three instances the party involved was victorious in both the Presidential and Congressional contests.

Not to be outdone by Federalists and Whigs, the Democrats had joined the game in the turbulent 1850's. Their victim was Franklin Pierce of New Hampshire, who beat Scott in 1852.

The amiable, somewhat inebriate Pierce, who had been sold in the campaign as a "Young Hickory," proved more pliable than the nickname suggested. His willingness to open the Kansas-Nebraska territory to slavery and his support for pro-slavery forces in the miniature Civil War of 1856 in "bleeding Kansas" was too much for many
Northern Democrats. His course also disturbed the party's political calculators, who saw the inept President as a potential loser in 1856.

Soon James Buchanan of Pennsylvania had his hat in the ring. Polished, urbane, and conveniently aloof from the controversy as American ambassador to England, he took an early lead at the convention; Pierce was second, in part because he controlled the federal patronage; and Stephen A. Douglas of Illinois was a poor third. When Pierce fell off badly on succeeding ballots, administration henchmen withdrew his name, and a seventh roll-call made Buchanan the nominee. This time the "available" candidate won handily—and settled for a single term, giving way in 1860 to Abraham Lincoln.

More than once Lyndon Johnson has suggested parallels between his burden in Vietnam and Lincoln's troubles during the Civil War, and in 1864 Lincoln also faced attempts to deny him renomination. In his case it was Radical Republican "hawks," however, who launched the attack. Two possible rivals sought to replace the "awful woeful ass," as a Cincinnati editor called Lincoln. One was his self-important, ever-ambitious Treasury Secretary, Salmon P. Chase of Ohio; the other the glamorous, erratic General John Charles Frémont, then in command at St. Louis. An old anti-slavery crusader, Chase gave up when pro-Lincoln party professionals undermined the Secretary's support in his home state and in neighboring Indiana. In border-state Missouri, Frémont had issued a local emancipation proclamation of his own before Lincoln was ready for such a policy, and an informal mass convention put him forward as a Radical Republican nominee. But the Radicals underestimated Lincoln's strengths. His sensitive humanity and deep concern had won him a place in the hearts of the voters. He also manipulated patronage and the party machinery with consummate skill; and as the convention neared, he demonstrated his availability when he won 278 convention delegates in the newly-established Presidential primaries, to 48 for Taft. But a Taft majority in the national committee controlled the patronage and the shadow-delegates from the Democratic Solid South. By rejecting contested Roosevelt delegates wholesale at the convention in 1912, administration managers were able to get Taft renominated on the first ballot. Even so almost a third of the delegates refused to vote, and nearly a sixth went for "T. R.," LaFollette, or other candidates.
Forthwith, Roosevelt and many of the progressives seceded. Declaring that he felt “like a bull moose,” T. R. proclaimed that “we stand at Armageddon, and we battle for the Lord.” Battle he did, at the head of a quickly formed Progressive party, soon nicknamed “Bull Moose.” But the Republican split gave victory to Woodrow Wilson, a Democratic progressive himself, while Taft ran a bad third and the Democrats carried Congress.

The attempt to shelve Truman was less apocalyptic. In the post-war years as Franklin D. Roosevelt’s vice-presidential successor, Truman also alienated elements within his party. As 1948 approached his political stock fell to an all-time low, and he was plagued by a widespread belief that he simply could not win. Party regulars, frustrated New Dealers, white-supremacy Southerners, union leaders, alienated intellectuals—all joined in the cry.

But the bouncy man from Missouri had to be shown. He had not lost what he would have called his “guts”; and when General Dwight D. Eisenhower and Supreme Court Justice William O. Douglas refused to serve as possible substitute candidates, concerted opposition in the North collapsed. Only Senator Richard B. Russell of Georgia opposed the President at the Democratic convention, and Truman won on the first ballot. Some of the Southerners bolted to support J. Strom Thurmond of South Carolina on a “Dixiecrat” ticket, and former Vice President Henry A. Wallace joined another “battle for the Lord,” at the head of a new Progressive party. Fighting back, denouncing the Republican “do-nothing” Congress, and responding jubilantly to the cries of “give ‘em hell, Harry,” Truman staged the last great whistle-stop campaign.

The result surprised nearly everyone except Truman, who was perhaps the only man who thought Truman could win. He triumphed with nearly half of the total popular vote in a four-party contest, and helped to return Democratic majorities to both houses of Congress.

Can a party dump an incumbent President? What chance would McCarthy or Kennedy have had to sidetrack Lyndon Johnson if he had not withdrawn? What does the record say to the maxims of the conventional wisdom?

It is far from unthinkable to dump the man in the White House. It has been tried in almost one out of every four contested elections before 1968, though only twice in seventeen elections in the twentieth century.

It can be done. Of ten attempts, five were successful, although two of the five successes were scored against men who had broken with their parties.

A movement to set aside an incumbent will not necessarily bring defeat in the fall election. The ten recorded attempts were followed in five cases by victory, in five by defeat. Where the incumbent was renominated, the record shows three wins and two losses. Where he was shelved, the party won in two cases and lost in three.

Case by case the records provide no evidence that attempts to dump a President were decisive in the election outcome, that the party would have won if only it had refrained from attacks on the man in office. The Republicans might well have triumphed in 1912 if they had united behind either Taft or Theodore Roosevelt, thus avoiding a third-party split. Yet, although the conventional wisdom dwells on this instance, it is unique. The outcome in every other case was determined by the over-all political situation of the time.

There is no correlation between efforts to dump an incumbent President and Congressional election results. Where the Presidential candidate has won, the party has generally done well in Congress; only defeat in the Presidential race has brought reverses in Congress too.

Yet the question remains—What would have happened at Chicago this summer if Lyndon Johnson had not withdrawn?

The five-to-five record of success in efforts to shelve an incumbent does not mean that the opposition forces of 1968 would have had a fifty-fifty chance if LBJ had carried his case to the convention. No movement has succeeded against strong chief executives or men who possessed powerful political appeal; all of the successes were scored against relatively ineffectual Presidents. Yet the contest of 1968 was hardly shaping up as an “ordinary election,” as Senator McCarthy observed, and it might have brought the first upset.

Past efforts to dump an incumbent have been most common in times of political stress and confusion. Thus, for example, five such attempts occurred between 1852 and 1872, the era of bitter slavery controversy, the Civil War, and Reconstruction; and three of the five succeeded.

Our times are the most critical since the 1860’s, and Lyndon Johnson is not precisely Lincoln any more than he is Millard Fillmore. The historical record and the politics of 1968 indicate that the anti-Johnson forces could have gone to Chicago without fear of serious repercussions in the November election, and that success was a real possibility. Whether the upheaval of our time would have been enough to lead the convention to “dump Johnson,” however, is uncertain. Events in Vietnam and the urban ghettos might have determined the result.

Yet the anti-Johnson movement has demolished for our time the myth that it is impossible to challenge a President from within his own party. This will remain the case even if Vice President Hubert Humphrey, resuming his campaign after Robert Kennedy’s tragic death, goes on to win the Democratic nomination. Insofar as LBJ was “pushed,” or withdrew under fire, his foes can claim the first victory of its kind.

In any event, 1968 will hardly go into history as an “ordinary” year.
THE FLYING BARNDOOO

Astrophysicists are in a pleasant quandary. They are collecting new data so fast that theorists will have to scramble to build up-to-date models of basic processes within and outside of our galaxy.

Dramatic discoveries of cosmic events, such as "quasars" and "pulsars," get into the news. But this is only one area in which striking new phenomena are being uncovered.

In another field of astrophysics, scientists measure high-speed atomic nuclei, called "primary cosmic radiation," which constantly shower the earth's outer atmosphere. Measurement of these atomic elements is an important contribution to our understanding of galactic processes (see "Cosmic Rays," Summer, 1965, Washington University Magazine). Finding the distribution of the elements in cosmic radiation can show how far the particles have come, their age, and what kinds of sources produced them. Elements heavier than hydrogen entering our atmosphere have been studied for twenty years and it has been established that the overwhelming bulk are composed of hydrogen nuclei (93 per cent) and helium (6.3 per cent). All the rest of the atomic elements, that is, atomic numbers 3 to 104, amount to only .7 per cent. And of this tiny proportion little evidence has existed until recently for cosmic radiation heavier than zinc, or atomic number 30 (Washington University physicists term elements of atomic number 30 and above "extremely heavy cosmic radiation," or EHCR).

In 1966, cosmic ray researchers were taken by surprise when the University of Bristol's cosmic ray group reported that they had identified uranium nuclei in an EHCR test. Very heavy elements of atomic number 90 and beyond should be extremely rare in any normal distribution of matter. Moreover, as they travel through interstellar space they should have a very high probability for breaking up. No one expected to find them in the Bristol test's first small sampling, and this intensified interest in EHCR.

Washington University's laboratory for space physics was in a unique position at the time of
Graduate students and their wives pitched in to put finishing touches on Barndoor II before it was covered with layers of plastics and special emulsions. McDonnell Douglas Corp. and NASA are helping to support the program.

Barndoor II, ten by sixteen feet, is shown hanging from "Tiny Tim," a huge vehicle used in launchings from the Scientific Balloon Base in Palestine, Texas; the square boxes below the Barndoor hold electronic equipment for radio control; off in distance, at right, the polyethylene balloon is being inflated just prior to the launching.
the Bristol report to enter the field of EHCR detection. The cosmic ray group had twelve years of experience with the "nuclear emulsion" detection technique used by the Bristol researchers. Nuclear emulsions are layers of photographic material especially sensitive to particle radiation. In addition, Dr. Robert Walker, McDonnell Professor in physics, had developed a method in which some common plastics could be used for the detection of EHCR. Unlike nuclear emulsions, the plastic sheets record only those tracks left by nuclei of about atomic number 30 and higher. This eliminates the prodigious chore of having to sort out the EHCR from millions of tracks that would be left by the lighter nuclei.

It was natural for the University space laboratory group, which includes Professors Michael Friedlander and Joseph Klarmann, to combine their respective techniques. Also collaborating in the experiment were Dr. R. L. Fleischer and Dr. P. B. Price of General Electric Co. The material in the new detector was simply layers of plastic which were sandwiched between layers of nuclear emulsion. The detectors were spread out over an area of more than 100 square feet. Appropriately enough, the University launches last September and May from the Scientific Balloon Base in Palestine, Texas, were called Barndoor I and Barndoor II, respectively.

Through the use of helium-filled polyethylene balloons, the detection equipment was carried to the outer limits of the atmosphere, or above 120,000 feet. Below this region EHCR are nearly completely destroyed through collisions with matter in the atmosphere.

"We would like to have kept the equipment up for forty hours," said Dr. Klarmann, "to collect as many of the rare particles as possible." "Unfortunately the balloon reached the Mexican border after fourteen hours, and the equipment had to be parachuted back to earth."

After the materials are shipped back to the laboratory on campus, the plastic sheets are immersed in a solution of lye which rapidly eats or etches out minute holes which each particle heavier than atomic number 30 penetrated. The tracks are then looked for both directly, by scanning the sheets with an optical microscope, and automatically, with a system much like the one used to find the leak in a bicycle tire. Once the track is located via the hole in the plastic, the particle producing it is identified by the characteristic shape in the nuclear emulsion. The latter method is used to provide a proven and reliable means of checking the results in the plastic.

Results from Barndoor I confirmed the existence of EHCR which had been predicted from studies of elements found in meteorites. (See "Fossil Tracks From Outer Space," Spring, 1967, Washington University Magazine.) No particles have been identified as yet in the region of uranium; the heaviest track found was rhodium, atomic number 45. However, to detect tracks in the uranium region with certainty, the researchers are agreed that they will have to develop much larger detectors, plus longer balloon flights.

Another long-range plan is to run EHCR tests in the Apollo "manned orbital workshop" space station which the United States hopes to launch in about five years. The University is discussing a major collaboration on such a project with the Manned Spacecraft Center in Houston, the University of Bristol, and General Electric Company.

In the meantime, the cosmic ray researchers will hunt for hens' teeth with barndoors.
Last summer Washington University engineering alumnus C. C. Duncan celebrated his fortieth anniversary with the Long Lines Department of American Telephone and Telegraph Company on shipboard supervising the first deep-sea plowing and planting of transoceanic telephone cable. He is the man responsible for AT&T's vast overseas operations which are carried over a globe-spanning communications network he has been instrumental in creating.
A family in New York receives word that their son has been wounded in Vietnam. The communique says that he is being treated for leg and chest wounds in a field hospital in Na Trang. Through American Telephone and Telegraph Company they get word to him to call home.

The son picks up a telephone in the Na Trang hospital. The call is carried over military ground circuits to Saigon, by radio to Hong Kong, by British Commonwealth underwater cable to Guam, over Bell Systems cable to the west coast of the United States, and across the U.S. on AT&T's long lines circuits. Within a few minutes the telephone rings in the family's home in upstate New York.

You can trace the path of the call on the world map in C.C. Duncan's New York office, following the black lines indicating the military cables that now loop Vietnam, the green lines of British cable, and the long red lines which are AT&T's undersea cable network. The map is criss-crossed with world-wide undersea cables, dotted with satellite and radio transmission locations, and marked with the four communications satellites.

In all, it represents the responsibility of Washington University alumnus C.C. (Cliff) Duncan, assistant vice president of American Telephone and Telegraph Company in charge of overseas operations. Duncan has been instrumental in creating the ever-widening network of satellite, high frequency radio, and submarine cable communications which links U.S. telephones to 200 countries.

"Vietnam is the first battlefield in history to be connected to the world by telephone," Duncan says. "Since the first of the year our boys have been able to call home from outside of Saigon and we have also set up communications to Thailand, Bangkok, and the Philippines for servicemen on rest periods. Some of these calls use a combination of cables, satellites, and ground stations.

"Before the war, service was by radio and we didn't have half a dozen calls a day. We had a very difficult time improving that service until the Guam-Hong Kong cable was completed in 1966. We get a good radio path between Hong Kong and Saigon so we now have seven circuits which handle about 150 non-military calls a day. That's not enough, but it will take care of the emergencies."

It is hard to imagine C.C. Duncan behind a desk. He overflows with energy. At leisure he puffs a stubby cigar, paces, and talks with a Midwestern twang and a crackering-barrel friendliness. A Duncan call to Mr. Ohno, head of Japan's overseas telephone system, sounds like a chat with a local telephone operator. Duncan is as much at home pacing the deck of AT&T's cable laying ship, C.S. Long Lines; poring over a chart of the South China Sea; flying above Alaska's wilderness; or standing before a London engineers' club as he is sitting in his twenty-fifth-floor office at AT&T's Long Lines headquarters in New York.

Since 1956, Duncan has personally directed the laying of 40,000 miles of telephone cable under the seas, more than any other man in history. He originated the concept of "hardened" overland cable and underground communications centers. He conceived and supervised the planning of an Alaskan tropospheric scatter radio system called "White Alice" to connect early warning radar stations to fighter bases inland.

Duncan began his career with the Long Lines Department of AT&T in 1927, a few weeks after his graduation from Washington University with a degree in electrical engineering. It was the year of the first overseas telephone call, transmitted by high frequency radio from New York to London. That year there were 2200 calls made to Europe at $7.50 a call. Last year 2200 calls from the U.S. throughout the world were handled by AT&T overseas systems every ninety minutes. A call to Europe now costs $7.50 by day and $5.70 at night.

This is the span of Cliff Duncan's forty-one years with Long Lines. He spent the early years in St. Louis and Dallas. Within the United States the Long Lines Department is set up primarily to interconnect Bell System companies. Without Long Lines circuits a call from St. Louis to New York would go through Southwestern Bell, Illinois Bell, Indiana Bell, and a number of other short circuits.

In 1951 Duncan left St. Louis to join the operating staff in New York. Two years later he became general manager.
of special projects, and in 1956 he was made chief engineer. He assumed his present responsibilities in 1960.

During the early 1950’s plans were just getting underway to lay Transatlantic One (TAT-1)—the first undersea ocean-spanning cable. Every step of the operation from cable-making to cable-tending was pioneer work.

Duncan and other engineers knew that the idea was feasible, but many questions were unanswered. Statistics told them that to be economically practical, cable components must have a twenty-year life span. Was it possible to manufacture cable repeaters, which amplify voice signals, under conditions which would assure trouble-free functioning for that long? Would fish eat through cable coverings? How much slack was needed to compensate for the rise and fall of the ocean floor? Once laid, could the cable be economically maintained? These and countless other problems had to be solved.

Early in 1955, the cable was ready. The next year the first transatlantic cable telephone message was transmitted from New York to London. Within a decade, Duncan had supervised the laying of three more transatlantic cables, a Pacific complex, and cables to Puerto Rico, Hawaii, and Alaska.

The early twin-cables and their more powerful single-cable successors had given Bell engineers the answers to many of their questions. Repeaters, which are placed within the cable every ten miles, today are manufactured by Western Electric Company, a Bell subsidiary, under conditions geared to eliminate imperfections. The assembly areas are kept surgically clean and employees wear special lint-free clothing. Each repeater takes sixty-three weeks to make and undergoes 1700 test procedures.

In July, a new cable carrying transistorized repeaters will go into service between Florida and the Virgin Islands. The repeaters amplify the voice to compensate for volume lost in travel along the previous miles. The new transistors, which replace vacuum tubes, have a low power requirement enabling Bell to put more units in each repeater and greatly increase the circuit capacity. A transistorized cable can carry 720 simultaneous conversations compared to TAT-1’s 36 and TAT-3’s 138.

Armored cable was laid on Transatlantic-One, but in today’s deep ocean cables the steel wires are placed in the center of the cable and covered with a tough polyethylene which is not eaten by marine life. Armored cable is still used for shore ends.

As the first step in laying an ocean cable, 50- to 100-mile lengths of armored segments are laid and the crew then splices cable onto the shore segment. When the splice is completed, the entire cable—both that already laid and that stored on the ship—is energized. Test officers are able to talk and test over the cable as the ship proceeds.

As the cable is laid, enough slack is calculated into the mileage to assure that the cable lies flat on the peaks and valleys of the ocean floor. The first transatlantic telegraph cables were laid with 20 per cent slack, but Bell engineers have cut that margin to about 4 per cent. Each per cent represented $500,000 to $1,000,000.

With the development of cable-laying has come the cable ship. Many of the innovations pioneered by Bell on the C.S. Long Lines are now used the world over. Last July Duncan was in Tokyo for the dedication of a Japanese cable ship which will lay, repair, and maintain cables in the Western Pacific. Because he was instrumental in its design, the Japanese have dubbed Duncan “grandfather” for the K.D.D. Maru. Though ocean cable laying had been constantly improved during the 50’s, Duncan was far from satisfied. One problem stubbornly persisted—fishing breaks.

“In 1959, my family and I were at a Pennsylvania resort,” Duncan relates. “I had just sat down, drink in hand, lighted a cigar, put my feet up on the coffee table, and said ‘This is the first time in six months that I’ve had time to relax’ when the telephone rang.

“A Russian trawler operating off the coast of Newfoundland had cut the transatlantic cable. In the excitement an American destroyer had rushed to the scene and boarded the Russian vessel. It created an international incident. I said to myself, right then, ‘We have got to learn how to bury those cables.’”

About 96 per cent of all cable failures have been caused by fishing activities. The rest have been things like icebergs, underwater landslides, or cable defects. The trawlers
drag their nets across the bottom and hook the cable. As the net is pulled in the cable may break or the fishermen may find the black sinuous monster lying hopelessly entangled in the net on the deck. Duncan says that fishermen have been very helpful but a net-cable tangle becomes a question of the cable or the net.

"You have to realize," he adds "that people have been fishing in some of these areas, as off Newfoundland, for centuries and that we are the intruders. We set out to find a way to bury the shore-end cables.

"Finally last summer we did it. We plowed in one hundred miles of two cables off the coast of New Jersey."

Bell Laboratories developed a sea-plow about the size of a Greyhound bus and weighing fifteen tons. The plow is towed behind a cable ship, sliding along the ocean bottom on sled-like runners, plowing, laying cable, and covering over in simultaneous operations. Last summer was the first time cable had been buried in water so deep that divers couldn't readily operate. Bell engineers believe the plow can operate in water depths up to 1800 feet, though to date it has operated only in 600-foot depths.

"The New Jersey bottom," Duncan explains, "is very hard clay. This is ideal for our plowing. We will not plow cable into very rocky bottom, both because of the difficulty and because trawling is impossible there.

"Last summer's operation produced some interesting sidelights. A television camera was attached to the plow so that, for the first time, engineers and scientists aboard the vessel could see the ocean bottom and the cable.

"I was interested in the fact that fishermen have been claiming for years that fishing was good around the cables because the fish were attracted to them. I was skeptical—it's an awfully good excuse for getting tangled up with the cables—but sure enough, every few feet along the old cable you could see nests. Those poor little things seek every bit of shelter they can find."

The cable-laying operations for years have yielded by-products for marine biologists and oceanographers, who go along or are sent specimens collected for them. Plowing will probably increase this sideline activity since it offers an opportunity to see the bottom along the shelf.

This spring forty-four miles of the Florida end of the St. Thomas cable was plowed off the Florida coast in a potential fishing area. "We expect that in the future whenever we place new cable we will plow in the shore ends if possible. On a proposed new transatlantic cable being able to plow will permit us to come off the coast of Rhode Island despite the fact that there is a big Russian trawling fleet operating there now. If we couldn't plow in, we'd have to come into the Virginia coast, and it would cost $4 million for 200 more miles of cable."

When cables are plowed in, their locations are fixed electronically and charted so that breaks can be located. Duncan believes that buried cables provide some measure of increased security against sabotage.

"But diversity is still the greatest security. We think it best to keep a balance of cable, radio, and satellite circuits. The 'hot line' for instance, isn't one line but a number of lines, traveling diverse routes, some cable, some radio, some satellite, and various combinations of these. One way or another we should get calls through."

Out of Bell System's pioneering work in communications satellites has grown COMSAT, the Communications Satellite Corporation, an agency for operation and development of international communications space devices. Bell now rents more than 200 circuits from COMSAT, and Duncan expects this number to reach 2000 in five years.

Within a few years many overseas calls will be dialed direct. A successful trial of direct dialing was conducted between New York and London and Paris. At present, phone users in this country can dial numbers in the Virgin Islands and as soon as the new cable is placed in service this summer, direct dialing will be extended to Puerto Rico, with substantial rate cuts.

"We have a number of problems to solve," says Duncan. "One is the incompatibility of the world's dials. Telephone dials are set up by various national patterns. Numbers dialed in the U. S. may be interpreted quite differently on a dial in Cairo or in Moscow."

"But we'll solve these problems and others. And when we have, we'll worry about what to do when a man in St. Louis calls up and says, 'My little boy made a mistake calling his friend across the street and reached Timbuktu.' "

The Monarch was pressed into service for early cable-laying, but today all cable is plowed, laid, and maintained from specially designed and equipped ships. The C.S. Long Lines lays cable from the stern at speeds up to eight knots, playing out cable day and night as it heads across the oceans.
The subject of abortion involves serious medical, legal, and moral issues. In this article, two faculty members of the Washington University School of Medicine discuss these issues and attempt to put them into the perspective of today's changing world. Dr. Peterson, head of the University's Division of Gastroenterology, is chairman of the Physicians Forum, a national organization of doctors dedicated to the goal of guaranteeing a single high standard of health care for all citizens. The Forum has taken the position that all laws which accept the view that abortion is a criminal act should be repealed. Dr. Vavra, a hematologist, has taken a long and active interest in the field of medical ethics, particularly as they apply to abortion.

**ABORTION**

By MALCOLM L. PETERSON, M.D.
Assistant Professor of Medicine

and

JOHN D. VAVRA, M.D.
Assistant Professor of Medicine

Discussions of abortion, a problem with medical and legal dimensions and moral overtones, arouse intense emotions. However, objective reassessment of the topic in medicine and in law is now occurring with increasing frequency. Laws enacted in the nineteenth century limited or forbade abortions as a reflection of the puritanical concern with sin, a fear of population limitation, and a regard for the health of the mother in an era when surgical procedures usually resulted in death from infection. As evidence of the fresh consideration of abortion, two professional groups last year announced, simultaneously and quite independently, positions advocating the repeal of all laws regulating abortion.

The Physicians Forum, a national organization of doctors dedicated to guaranteeing a single high standard of health care for each citizen, regardless of his ability to pay, stated that "abortion is a medical concern and [we] urge the repeal of all laws which accept the premise that abortion is a criminal act. Such laws restrict the physician’s ability to render the highest level of medical care. Thus these laws deprive the pregnant woman of her right to health."

The American Civil Liberties Union, a national organization concerned with ensuring the protection of the rights and liberties guaranteed by our Constitution, issued a statement advocating that "all criminal sanctions should be removed from the area of abortion, and the laws and standards governing this medical procedure be the same as those which govern the performance of all medical procedures."

We wish to examine the medical and ethical implications of such recommendations. Abortion refers to the termination of pregnancy before survival of the fetus is possible. The term includes spontaneous as well as intentional interruption of pregnancy. Physicians often identify an induced abortion as "therapeutic," to distinguish it from the so-called "criminal" abortion, one which can legally be performed only under limited specified circumstances. These circumstances differ markedly according to state laws, religious and social influences, and hospital practices. Thus, the situation leading to the majority of induced abortions—the illegal abortions—is to some measure dictated by the rigidity of local practice. A physician finds himself handcuffed by restraints which usually leave him no recourse but to maintain the pregnancy even if both he and his patient should consider abortion to be the sounder choice.

In the face of these legalistic restrictions, in which abortions are fundamentally criminal acts, what is the actual situation of abortion in the United States? Obstetricians estimate that most pregnancies spontaneously terminate in the first several weeks. Spontaneous abortion ("miscarriage") is much more prevalent than induced abortion. Using available statistics, the number of fertilized eggs actually carried through to live births is relatively few, perhaps one in twelve. That fraction of total pregnancies artificially terminated is thus very small, less than one in sixty. However, the absolute numbers of such illegal procedures are amazingly high. By their very nature these statistics cannot be documented, but estimates of the number of criminal abortions in the United States range from 200,000 to two million per year. If
there are two million abortions per year, then at least one woman in one hundred in the child-bearing years actually undergoes abortion. Who are these women? Why do they seek abortion?

It has been proven repeatedly that of every twenty abortions in this country, about nineteen are performed on married women who already have children and are living with their husbands. Dr. Sophia Kleegman, clinical professor of obstetrics and gynecology at New York University College of Medicine, found that 90 percent of out-of-hospital abortions were performed on married women with three or more children. Obviously then, the usual image of a pregnant, unmarried girl desperately seeking escape from her unexpected and undesired burden is most inappropriate. The unwed woman who wishes to evade the stigma of illegitimate pregnancy is much less common than the responsible mother who fears the economic or marital strains another child would bring.

W hat is the consequence of criminal abortion? Since illegal abortions necessitate clandestine, ill-equipped operating conditions, the risks to the health of the patient are great. It is known that each year at least 10,000 women die as a result of criminal abortions. The proper medical technique of abortion requires general anesthesia during which the cervix is dilated with metal probes so that a curette, a loop of steel band with a knife edge, can be introduced into the womb. By using the curette in a scraping fashion, the lining of the uterus to which the embryo is attached can be removed from the underlying muscular wall, which is quite thick and strong until the third month of pregnancy. The curettage can be performed quickly and without appreciable risk in skilled hands, but accidents with anesthesia, uncontrollable hemorrhage, perforation of the uterus, infection of the scraped wall, or incomplete abortion can easily result if operating conditions are not optimum. After ten to twelve weeks of gestation, the wall of the uterus becomes so thin that risk of perforation is greater.

In most illegal situations, qualified anesthetists, emergency corrective measures (blood transfusions, extensive operating supplies to rectify surgical complications, and emergency drugs to combat adverse reactions), and proper sterilization equipment are not available.

Many abortionists use even less sophisticated techniques. For example, introduction by tube of an organic solvent, such as ether, into the uterus is often followed by complications leading to death. It is little wonder that the leading cause of maternal death in California (1957 to 1965) was criminal abortion. The mortality rate of abortions done properly is less than three per 100,000 in countries which permit all abortions to be done in hospitals. This statistic, compared with an estimate of perhaps one thousand deaths per 100,000 abortions in the United States, is a commentary on the results of using insanitary facilities and inadequate techniques.

Although curettage is presently the commonly practiced mode of abortion, it is probably going to be replaced. Simpler, safer procedures which require no anesthesia and no surgical manipulation are in view. Placing in the cervix an instrument which can produce a vacuum in the cavity of the uterus resulting in separation of the fetus has proved successful and very safe. Ultimately the use of chemical agents, "abortifacients," which the mother can take to disrupt the cellular growth of the fetus, can be foreseen. Such drugs are presently available; the difficulties in using them involve knowing how much to give to be effective without harming the maternal tissues, and ensuring that the abortion which results will be complete without requiring curettage. Some research has been directed toward the discovery of a "morning after pill," which the woman could take after intercourse to prevent implantation of a fertilized egg in the uterus. Such developments make present concepts of abortion tentative and only add to the difficulty of arriving at a satisfactory ethical and legal position.

Most abortionists are not careless. Although the very fact of their illegality seldom permits the highest quality of medical care, the need to escape detection demands that maternal death not lead back to the abortionist. In some cities the risks are so great that patients pay as much as $2,000 for abortions (in St. Louis the costs run from $400 to $800). This is obviously a quite lucrative racket and one which is fostered by existing laws. Traveling to Europe, Japan, or Puerto Rico to have an abortion performed runs the costs to even higher figures.

As a result of the high cost, few poor families can avail themselves of a sophisticated abortion, and the correlation between cost and medical risk works against those who can afford only a cheap abortion. Thus, while most illegal abortions are performed on white women, most abortion deaths occur among black women. These facts were underscored by a study of therapeutic abortions performed in New York hospitals in 1960-62. The therapeutic abortions for white women numbered one per 380 live births; for Negroes, one per 1000; for Puerto Ricans, one per 10,000. In private New York hospitals, 6.3 abortions were performed per 1000 live births, but only 1.2 per 1000 in municipal hospitals. The fact that 93 percent of legal abortions in New York City were done on white patients in private hospital rooms is further testimony to the inequality of medical care available to black and impoverished citizens in the United States.

Figures on the incidence of abortions, associated maternal deaths, and costs are relatively easy to compile, but the overall consequences are more difficult to ascertain. The full assessment of the psychological effects of abortion, and comparison of this assessment with the psychological effects on mother and child of not having an abortion, are beyond our present knowledge. Many available reports of psychiatrists' impressions of the psychological consequences of abortion suggest that maternal guilt feelings are transient and do not significantly exacerbate pre-existing neurotic disorders. On the other hand, psychiatric experience with postpartum psychoses and long-term maternal illness related to bearing an unwanted child is well documented.

From the economic viewpoint, the cost of supporting children in surrogate homes or through programs of Aid to Families with Dependent Children, and the social and monetary costs of institutional care of the criminal spawned in an environment without love and tortured by maternal (and paternal) rejection are vastly greater.
than the expense of an abortion. Karl Menninger, the noted American psychiatrist, has written that "nothing is more tragic, more fateful in its ultimate consequences than the realization by a child that he was unwanted."

Such considerations have already led to legal reforms in some states and more are being considered. In drafting revisions of existing laws, legislatures have studied the regulations in other countries where abortion has been legally practiced for some time. In Yugoslavia an abortion is performed "when it can be reasonably expected that the pregnant woman will find herself placed, as a result of the birth of the child, in difficult personal, family, or material conditions which cannot be remedied by any other means."

In the Scandinavian countries, which formerly authorized abortion only as necessary for preservation of the life of the mother, the laws now recognize the broader social implications of health. Most pregnant women who feel they want to have an abortion seek advice in maternal centers where they receive evaluations of their physical, mental, and social health. Believing that "when a woman wants an abortion there must be something wrong either with herself or with the life situation or both," the Scandinavian physicians analyze the patient's entire circumstances. "If an abortion is found necessary, we feel it should have a therapeutic function as part of a larger social, psychiatric, and medical treatment plan."

To understand proposed changes in American abortion laws, we have to examine the arguments which tend either to restrict or expand the legality of abortions. Recent attempts by a number of states to change abortion laws have brought out conflicting opinions and attitudes. Many arguments are based upon premises which are difficult to defend. There have been three perspectives within which the problems of abortion have been formulated and solutions proposed. The perspectives are identified by what is considered one's major responsibility: (1) the unborn and unwanted child, (2) the woman who has expressed her desire to have an abortion, or (3) the body of laws and statutes set up to regulate all members of the community.

Each of these perspectives permits analysis and interpretation of the facts already presented, giving more weight to certain ones over others, by evolving principles to justify the point of view. Each treats with major emphasis the claims of one point of view and is less sensitive to the claims of the other two. Each permits the occasional exception to the principle and solution, usually by arbitrary definitions. The problem remains insoluble, for there is no single perspective which does justice to what each argument claims for itself.

Those individuals who identify the major responsibility of physicians and society to the unborn fetus base their arguments upon the right of an individual to life. They argue that once life has been initiated there is no legitimate claim for human intervention, and the fetus has the right to be born and to live. This view has been defended philosophically by appealing to "natural law" and theologically by maintaining the "sanctity of human life." Both have been responsible for the strict abortion laws written in European countries with strong puritan and Roman Catholic backgrounds.

Certain problems arise in following this line of argument to its logical conclusions. First, the interruption of pregnancy is identified with murder, an emotionally charged word which usually terminates all further consideration and discussion.

Second, this argument assumes that the value of the "blueprint," i.e., the embryo, is equal to that of the "completed structure," the adult human being. To become an adult with fully-developed human characteristics requires growth and development over years, and the outcome, the "structure," cannot be predicted with certainty. To protect the life of the fetus at all costs is to equate the value of a blueprint with the structure to be built from it, the presence of life with its quality, and the right to be alive with the right to be a person. The assumption is that every fetus is potentially a Beethoven, forgetting that it could become a Genghis Kahn.

Third, the point of view that the fetus has exclusive rights ignores the problems confronting the woman desiring an abortion. Women also have rights to life and personhood, and an unwanted child may be a legitimate threat to her health and well-being. Furthermore, in order to admit the legitimacy of abortion in certain circumstances such as rape and incest, definitions of "life" and "human being" are required to avoid violating the principle of the sacredness of human life. All such definitions which have been proposed are arbitrary and have implications in other medical-ethical controversies, particularly birth control and euthanasia.

From the second perspective the major responsibility of physician and society is to the health and welfare of the woman wishing an abortion. This point of view places major emphasis on the well-being of the woman and sees her unwanted pregnancy within the perspective of her total life situation. It is more likely to accept abortion as a legitimate solution for family planning or in terminating pregnancy in very young girls or in women who have proved to be irresponsible mothers. Under current state laws physicians who concur with this point of view consider it their responsibility to help their patients in these circumstances and look upon the abortion racket as a mixed blessing, in that, abortion can be obtained where none can be performed legally. Such physicians may direct patients to contacts through whom a reasonably safe abortion can be obtained, and they ask the patient to return for proper care in the post-operative period to prevent major medical complications.
There are several problems for those who would use this perspective of the primary responsibility to the pregnant woman in arguing for reform of current laws. By claiming that abortion is predominantly a problem involving protection of the health and well-being of the woman, abortion may be defined as a medical problem in order to establish a medical basis for the procedure. In fact, the remarkable advance in medical knowledge over the last decade has reduced the number of legitimate medical reasons for terminating pregnancy on "therapeutic" grounds of protecting the life of the mother.

By accepting her request for abortion as the best judgment consonant with her health and well-being, proponents of this perspective accept the woman's diagnosis and evaluation of her problem. Doctors don't let patients diagnose and prescribe treatment for other illnesses. Abortion "on demand" is inconsistent with medical practice.

The use of the term "therapeutic" obscures the problem by using such concepts as "mental health" and "emotional well being" as organic medical terms. What is desired is not therapeutic, but humane abortion, the latter term implying that a broad evaluation of all factors has been made to define the most satisfactory, humane solution for both mother and fetus.

Proponents of the maternal-rights perspective overlook the problem that a physician, confronted with a woman having overwhelming personal problems, may become insensitive to his responsibility to the fetus. The fetus is not like an appendix or tumor which may be therapeutically removed; nor is it a woman's right to control her fertility through birth control the same as terminating a pregnancy once it has unintentionally occurred. The physician is obliged to be as honest as he can in his evaluation of the problem, which sometimes means that the most humane solution may not be abortion.

The third perspective identifies the primary responsibility of the physician and society to the body of laws irrespective of the individual problem. This point of view states that the statutes and laws have been established to promote the total health of our communities. Individuals are lived within the context of communities. Therefore, legal and social restrictions upon individual behavior are for the benefit of the total community. Proponents of this view argue that in the past the law has protected the life of the fetus, and unless our social conditions are drastically altered, the law must continue to protect the fetus or it must define the specific situations for which abortions are permissible and not criminal.

There are several problems in defending this point of view. The first is the "camel's nose" argument, i.e., if a camel gets his nose into a tent you can't keep the rest of him out. If one permits abortions to be done for poorly specified reasons, then they will be done for many and varied reasons and the moral and ethical basis of our society eventually will be undermined. Actually this argument has been shown invalid by the experience in other countries, like Japan, where more liberal abortion laws have not led to indiscriminate widespread abortions and an undermining of public morality.

Our strict abortion laws have not accomplished what they intended but have permitted a lucrative abortion racket to flourish, caused abortions to be available only to the wealthy, and have created a significant risk to the health and safety of the large number of women who have abortions. There is little reason to believe that even stricter laws would be any more effective.

Finally, the definition of abortion as a crime suppresses open discussion of such an emotion-charged issue. Laws which brand as "criminal" certain actions done against the letter of the law but which could be interpreted to be within the spirit of the law suggest that man was created to obey laws and ignore the view that laws were written to humanize life.

In attempting to formulate some reasonable solutions to the abortion tangle, a more open approach to the issues must be available.

Our Western cultural traditions have been founded upon two basic principles: the right and duty of a person to achieve whatever individual excellence is within his capacity, and the importance of culture and society as the framework for life. To become a fully integrated person requires individual values such as personal vision, industry, and purpose, as well as a healthy social and political environment. Both are necessary for a person to achieve his humanity. Both in a sense are man's birthright, but they are not free. They must be worked for and created. It is within such a context that abortion must be approached to reconcile the three points of view.

The standard answers and laws which have regulated abortion in the past have been called into question in the present. The obvious and best solution to the problem would be for the mother to accept and love her baby, acquire a responsible husband if she does not have one, find some source of stability in a family already under economic or social stress, and live happily ever after. Unfortunately solutions are not worked out that simply.

It should be evident that no solution will be unambiguously clear and definable as right. The decision to have an abortion frequently leaves a woman with feelings of guilt, inadequacy, and personal failure. The decision to avoid abortion frequently aggravates personal problems and alienates family members, leading perhaps to rejection and lack of love for the baby or even to a reluctant surrender of the baby to an adoption home. Mothers have rights to a life of love and achievement within stable, healthy families; babies have rights to grow up to adulthood and security in loving families. Judging the effect of an unwanted and unborn child on a mother and her future, and the threat of an irresponsible mother and a friction-tern family to the unborn child is not possible.
with any degree of certainty. To identify one's primary responsibility to the unborn fetus, or to the reluctant mother, or to social law and order may make decisions easier, but it does not guarantee a successful resolution.

It is precisely within this ambiguous situation that physicians should have the freedom to deal with women desiring an abortion in as sensitive and responsible a manner as possible. Each woman brings into such a patient-physician relationship a complex set of problems to which an unwanted pregnancy has added further stress. The solution in the woman's opinion is to relieve the added stress by having an abortion. The physician is requested to use his skills to implement this solution. But the physician at the same time must act in as responsible manner as possible to all concerned: the fetus, the woman, the community to which he belongs, and himself.

The most sensitive ethical approach would appear to be based upon the general principle of doing the most loving and just thing for all the individuals involved, relying upon the contextual elements of each individual woman's problem for the clues to the best solution. It would mean understanding and supporting the woman without dismissing responsibility to the fetus and to society. For the married woman seeking an abortion as a means of family control, this would mean examining the attitudes of all individuals involved and searching for solutions which would permit saving the pregnancy. Solutions might require the provision of psychological support, additional economic support, or assistance in household management. Obviously the help of other individuals—clergy, social workers, friends of the woman—may be essential in finding the humane solution. In this broader sense, the physician is one of several parties seeking a medical-social-economic solution for the individual woman.

In the case of the unmarried pregnant woman requesting abortion, there are fewer options for saving the pregnancy, but the same approach is necessary. Having the baby and giving it up for adoption may be intolerable, and so may be the social stigma of having to drop out of school or to face one's family and friends. In many cases, marriage is not possible or even desirable.

When the individual problem indicates that abortion is the most reasonable solution, the physician should have the freedom to have it performed in a hospital with maximum safety. When there appear to be other reasonable solutions which could save a pregnancy, then the physician should advise against abortion. The physician's responsibility does not terminate with a successful abortion, but continues until the woman has been restored to as stable a situation as possible. He should certainly be available to deal with later psychological effects. Part of his responsibility is good birth control advice: another unwanted pregnancy following an abortion represents a serious failure in evaluation of the case.

AN ESSENTIAL FACTOR in establishing this freedom for dealing with abortion is a sound social environment with more liberal abortion laws. The laws presently enforced by most states do not permit abortions except for a few specific reasons. It is unlikely that abortion of abortion laws is immediately possible. Those who advocate liberalization of these laws rather than complete repeal usually suggest that in-hospital abortion be permissible if continued pregnancy endangers the mother's physical, mental, or social health; if there is reasonable likelihood that the child will be seriously deformed or mentally defective; if the pregnancy is the result of rape or incest; or if the patient is unmarried and under age sixteen.

It is obvious that these changes in criteria will not guarantee that individuals will act responsibly, nor will individuals who have their minds made up as to the evils of abortion be likely to change their opinions. For this reason it seems to us imperative that, together with changes in the law, physicians interested in the abortion problem and other professional individuals in the community should form some identifiable association to which women could be referred and treated. Such associations could be identified with medical institutions, public health and welfare agencies, or church consultation services. The association should include individuals with professional training: physicians, clergy, social service workers, and lawyers. To keep the groups from being considered as legalized abortion mills, it should be made clear that a woman asking for help would be aided in every possible way to evaluate and work out her problems without interrupting the pregnancy, or would be provided a safe abortion when this is the reasonable solution.

Even though it is likely that abortions would be permitted for a variety of reasons evaluated as detrimental to maternal well-being, it is also likely that not every woman's request would be honored. Nor should physicians feel compelled to acquiesce under the threat that the woman would take her business elsewhere, even though he would continue to feel responsible for her. Each of the individuals would be obliged to act as responsibly as possible to all involved, whether the decision would be to recommend abortion or not. The goal should be to restore the woman to a healthy and loving environment, saving the life of the fetus whenever possible.

Such associations of trained and concerned individuals could become an important educational device for the community by demonstrating the workability of the contextual approach to ethical decisions. Furthermore, abortion will no longer be seen as just a medical problem involving only mother and physician, but as a medical-social-economic problem involving the woman's total life and requiring professional help of many different kinds.

There are already professionally trained persons in our communities working with women wishing and needing abortions. It appears likely that these professional people, as well as many others interested in humane abortion, would willingly form such associations. A woman could feel confident of consulting persons capable of helping with her specific problems, and she would also be assured of sympathetic follow-up care.

It is clear that in our complex society a new approach to the abortion problem is necessary. We have attempted to outline the problem and the approach which seems to us to be the most workable. It requires liberalization of abortion laws and the cooperation of professional individuals capable of evaluating each woman's individual problem, helping her to solve them without abortion if possible, but providing her with a safe abortion when it appears desirable.
"I'm a little worried about my future."
Voiced by Benjamin Braddock, the antihero of "The Graduate," a brilliant satirical movie, this one sentence expresses the doubts of thousands of college students. For some of them, the answer to the problem is graduate school. A small percentage, it is true, become "professional students," putting off for as long as possible their career choices. But the great majority of these students finish their graduate education and move on to professional careers and a myriad of other services to their communities and to the nation.

Veterans on the G.I. Bill made up the first great influx of married graduate students to the American campus in the mid-40's. Today an increasing number of younger married graduate students have taken their places in the academic community. The combination of marriage and intensive study has received tremendous encouragement in the past ten to fifteen years through massive infusions of private and federal government funds for graduate education. Today's married graduate student finds he no longer has to tiptoe past the bursar's door.

The four couples in this article are representative of this changed character of graduate enrollment and support. Freed from large financial burdens and secure in their choice of a teaching career, they are able to combine successfully the dual responsibilities of marriage and graduate school. Their lives are enjoyable and stimulating; they are doing what they want to do.
THE TEITELBAUMS

"I've been galloping around English Literature trying to find a place," said vivacious Eve Teitelbaum. This tall, slender young mother is a Ph.D. candidate in the English Department. "People outside the University do look surprised when I tell them I'm a graduate student," she said, "but actually the combination works quite well." Eve's husband, Steve, a clinical fellow in surgical pathology at the Washington University School of Medicine, is pleased that his wife is doing what she likes. "He's very considerate about the whole set-up," said Eve. Caren, their talkative two-year-old, likes visiting the campus and seeing English professor Leon Gottfried, whom she calls "Uncle Wiggly."

While Eve is busy on campus during the week, Caren stays home with her babysitter, who also keeps the Teitelbaum's attractive house in order. "I've been very fortunate in finding good people to take care of Caren," said Eve as she sat in her sunny kitchen sharing a box of Froot Loops with her daughter.

Eve does the majority of her studying on campus because she finds it hard to concentrate at home. "Caren is so much fun now that I'm torn between playing with her in the evenings and studying," she admitted. "If the babysitter weren't here during the day, I probably wouldn't get much work done at all."

Finding time to keep up is also a problem for Steve. "I think that's the frustration of being a twentieth-century man," he said. "I've had to adjust to the fact that I'll die not having read most of the great things that have been written."

When Eve entered graduate school in the fall of 1964, Steve had completed his M.D. and was working as a house officer at Barnes Hospital. "English, art history, and journalism were the three fields I was interested in," said Eve. "But I figured I'd never be able to be a real newspaperwoman with a family. And art would have been cumbersome unless I could get to New York, Italy, or France whenever I wanted. I'd just have been back to looking at tiny slides as I did at Mount Holyoke." After a year of intensive course work for the master's degree, Eve left the University to go to New York where Steve served a two-year residency at Bellevue Hospital.

Even though she was away, Eve was able to continue her studies. "From the middle of March, when Caren was born, to a year from the following June, I didn't do anything but take care of her and study for my qualifying exams," she said. "And when I passed those, I immediately started panicking about my comprehensives, which I'll have to take next year!"

Since her return to St. Louis, Eve has detected a change in the University atmosphere. "I felt three years ago that this was a man's field," she said, "but not now. There seem to be more women in graduate school, at least in my classes."

"We both want to stay in academics," said Steve, who will be an instructor on the pathology staff at Jewish Hospital next year. Eve will also be teaching as a graduate assistant in the freshman English Composition course. "I've been watching my teachers very closely lately," she said. "I'm terrified about facing my first class. I've never taught anybody anything."

For Steve, teaching is an incentive to learning. "In medicine," he explained, "people who teach practice their specialty at the same time. Teaching keeps you on your toes because you've got to keep reviewing your fundamentals. I just don't want to fall behind."

When Eve has completed her dissertation, the Teitelbaums plan to go to Boston or the West Coast. Even though they are both from New York, they don't want to go back. "Yeah," said Steve as he dug into the Froot Loops, "the best thing about New York is that it's on the way to Europe. Now that I've finished my residency and we're out of the red, we're going to do a lot of traveling!"
"The funniest thing I can imagine is going home to my parents," said Hangja Allison, with a merry laugh. "Nobody will know what to do with Rees—my parents don't speak English and he doesn't speak Korean!" Rees, a graduate student from Brighton, England, met Hangja about two years ago at a foreign student party. "The type of generosity that is thrown at foreign students here is incredible," he said. "Strange people lavish food, time, nice homes on you. I can't imagine that happening in England."

The Allisons' life in St. Louis has not been without adjustments. Hangja laughed when she recounted their joint cooking efforts. "Sometimes we're both starving for our own kind of food," she said, "so we go to the kitchen and Rees cooks English food and I cook Korean." Their car, a red Volkswagen, has seduced Rees into a more sedentary life. "In England," he said, "I walked about three miles a day. But here I literally begin to feel unfit."

Rees, who is studying in the Music Department with Professor Robert Wallenborn, came to St. Louis three years ago from the Royal Academy of Music in London. During his four years of undergraduate training there he studied piano, organ, and harpsichord, unlike music students in this country who generally have a more varied education. "Even purist places like Julliard give their students some liberal arts," said Rees.

He decided to do graduate work in piano at Washington University when his harpsichord instructor, Geraint Jones, returned from a United States tour with favorable reports about music education in America. "I couldn't have expected to be anything much more than a teacher's college training teacher if I hadn't come here," said Rees. "There are almost no practical university music departments in England; it's all conservatory training."

Although Rees is a pianist, he has not completely forsaken the harpsichord. In the summer of 1966 he and Hangja joined the Concordia Seminary Choir on a tour of England, Holland, Germany, and Belgium. The tour was hectic but most enjoyable. "It was fun finding unexpected harpsichords in unexpected places," he said.

When Rees and Hangja came to the United States in 1964, they both expected to be here for only two years. "I had a dream of getting a degree outside of the country so that I could get a better job in Korea," said Hangja. She was understandably delighted when her American Jesuit college in Korea recommended her for a scholarship in the speech and drama department at St. Louis University.

As a foreigner, however, she found it hard to get a speech job when she completed her master's degree, so she decided to help support her husband by working at Olin Library. Although Hangja still has an accent, she admits, with a tinge of regret, that she is quite Americanized. "But," she said, "the longer I stay here the more I miss Korea, maybe because you forget about the bad things."

Rees had originally intended to get just a master's degree in music, but the Department has awarded him enough financial support to go on for the Ph.D. Rees's graduate assistantship provides him with tuition and a tax-free stipend. In addition, he gives piano lessons and participates in occasional concerts and recitals. And on Sundays he plays the organ for morning services at St. Peter's Church in downtown St. Louis.

In 1970 when Rees's Fulbright travel grant runs out, the Allisons will return to England, but they are not sure that they will stay. At this point Rees is not convinced that he wants to make the self-sacrifices that are necessary to becoming a concert pianist. "London is great to live in," he explained, "but the only people who get work there are international artists." And, because of the differences between American and British methods of teaching music, Rees may come back to the United States. "What I would really like to do," he said, "is teach a bit and play a bit."
THE CHINS

In 1963, Stan Chin, a graduate of the University of California at Berkeley, was supporting his wife and two daughters by teaching high school chemistry in Oakland, California. The routine of teaching and the compulsive urge to see what was on the other side of the Rocky Mountains were the stimuli for Sharon and Stan's first venture into the mysterious Midwest.

Stan had made up his mind to return to school when an article in Time Magazine caught his eye. It was about Arthur Holly Compton, Nobel Prize-winning physicist and former chancellor of Washington University. Because Compton had been its chancellor, Stan reasoned, Washington University was almost certain to have a good physics department. And since he had decided to brush up on his physics, Stan thought that St. Louis was the place to come. In 1964 Stan was awarded a teacher's grant from the National Science Foundation for one year's work at Washington University.

The Chins arrived in St. Louis on a hot summer night. Within an hour they had seen the gracious homes lining Lindell and the slums on Delmar. It was an education for the young couple. "We were very naive," said Stan. "We were surprised that everything was built of brick. Because California is a newer area of the country, I had never imagined that other parts of the country used different kinds of building material." They were also faced with definite changes in seasons after the mild climate of California. "The first winter was disappointing," said Sharon with a smile. "Our relatives kept writing and saying 'I guess you must be buried in snow,' but there was hardly a flake!"

One of the hardest adjustments Sharon had to make to graduate student life was not having her husband home in the evenings. "At first I watched a lot of television," she admitted. "But after Annie was born I decided to go on a self-improvement program." Since then she has taken several night school courses and has joined a church group. Some day, perhaps when her children are older, Sharon hopes to complete her degree in teaching and child development.

Although Stan began in physics at Washington University, his predilection for chemistry was still with him. He began taking advanced chemistry courses in his second semester, and by the end of the year had decided to accept the Chemistry Department's offer of a three-year National Defense Education Act Fellowship.

Working under Professor Sam Weissman ("a great man, very bright, very humble"), Stan has completed all the requirements for the Ph.D. except the language examinations and the dissertation. His two current research projects deal with hydrogen atom exchanges, and DNA molecules. "But," said Stan, "not everything works when you want it to." He's had difficulty in purifying the substance he is using in the hydrogen atom exchange and his DNA research is bogged down too.

Stan is confident, however, that he'll find solutions to his problems and be able to complete his research next year. Then he hopes to be off to the East Coast for a year's postdoctoral study, a sort of internship in the sciences. The Chins live in a spacious second-floor apartment in University City, a residential area northwest of the University. Stan is home on weekends now, and the five Chins take frequent outings in their station wagon, particularly to the older residential parts of St. Louis.

Although the Chins have grown to like the Midwest, they will probably settle in California, where their parents are in the food business. Sharon's father manages a supermarket and Stan's owns a chop suey house in Oakland.

After five years on the other side of the desk, Stan will return to teaching on the college or university level. "It's my first love," he said. "He's a born teacher," said Sharon proudly. "He says it keeps him on his toes."
THE STODDARDS

Denis Stoddard radiates self-confidence. A good listener as well as a good talker, this sandy haired young Mormon gives one the feeling that he could do almost anything well. At present he is deep in his books, studying for his comprehensive exams in sociology. "The panic has definitely set in," he said with a wry smile.

For the ten years before he came to Washington University to do work in social psychology, Denis combined various engineering drafting jobs with his college education. "I've always liked the exactness of the physical sciences," he explained. "But at the same time, I've been interested in the interaction of people, in motivation, and in how you can make a group function."

As an assistant in Professor Robert Hamblin's laboratory on campus, Denis is doing research that combines the precision of engineering with his interest in people. In the laboratory, which is located in the basement of McMillan Hall, students and professors work with pre-school children applying social exchange theory, in which desired behavior is rewarded and unwanted behavior is ignored. Denis has found his work in this experimental classroom both interesting and rewarding. He hopes to base his dissertation on a successful project in which he got older children to help teach the younger ones.

Denis and his pretty, soft-spoken wife, Laurie, came to the University two years ago from Brigham Young University in Utah. "We're in good financial shape now," said Denis, "but our first year of marriage was rough. I worked weekends and sometimes nights plus going to school. Laurie got half salary in one of the lowest-paying school systems in the nation. With our combined incomes we lived on $200 a month — our food bill ran about $5 a week."

Now the Stoddards are able to save as much as they earned each month in Utah. As a supplement to Denis's research assistantship, Laurie has continued her teaching. "Ladue is certainly different from the rural area in Utah where I did my student teaching," said Laurie. "There education wasn't that important, but they worshipped the ground that the teacher walked on. Here education is everything and the teacher is just a means to get it. The kids are under a lot of pressure and there is much more cheating. They're socially ahead too — all the little girls have to be dressed in the latest minis and high boots. It's too much, too soon."

In spite of their busy schedules, both Laurie and Denis are active in the Church of Jesus Christ of the Latter Day Saints. In his church group Denis is looked upon as a missionary, in the laboratory he is regarded as a professional, and in his classes he is one of many graduate students. Denis handles his different roles with great confidence.
A two-room country schoolhouse offers to alumna Ellen Rosenthal Kalbac, AB 67, a brush with American history—an experience with an educational system that has changed only slightly in the past two hundred years.

TEACHING IN TRADITION

By MARY JANE BEBOUT

Office of Publications

The last thing to be accomplished before lunch was the spelling test. The children in each row worked as one, waiting for the word, listening, and then hunching over their papers to write it down. At the front of the classroom, the teacher read off the words, making up sentences using them.

"First grade—little. The little girl ran into the house. Second grade—story. Tell a story about what you read this morning. Third—Saturday. On Saturday we do not have school. Fourth—sudden. A sudden shower cooled the earth."

There are four grades in this room of the New Providence School, a rural school outside Columbia, Missouri. There are two classrooms, two teachers, eight grades, and a total of forty-one pupils. From 8:30 a.m. to 3:30 p.m. each day, eighteen of those pupils are taught by Ellen Rosenthal Kalbac, AB 67, a young woman who, a year ago, would not have believed she could ever be in such a situation.

Any morning with Ellen is bound to be a study in constant activity. This particular morning was no exception, and was perhaps a little more active because of the weather. The day had started out stone-gray and rainy, and there was still no change. When the school bus arrived shortly before 8:00, the children had had to come directly into the building rather than play outside. But promptly at 8:30 they were in their seats, the proper books laid out on their desks. School opened with the Pledge of Allegiance.

Like a juggler with four balls to keep up and moving, Ellen started the second and third graders to work at their reading and spelling. She reviewed a test with the fourth graders and gave them the morning's assignment—readings in American history. Then it was time for first-grade arithmetic. During the morning Ellen worked with the grades separately, the children in each grade gathering around her desk at the front of the room and then returning to their own row to continue working.

Independent work is vital to the progress of each grade and the entire classroom, but the children are not left without guidance. Interruptions are constant, but they are handled quickly and quietly. An unfamiliar word, a dress sash that needs to be re-tied, an explanation of the Spanish-American War—these can and do come up in the middle of "15 take away 9." Similarly, a sticky problem in division may interrupt a discussion of the political contributions of Henry Clay.

Afternoons follow much the same pattern, with the older students taking up language, science, and social studies while the younger ones work at reading, spelling, and arithmetic. Because many of the children live on outlying farms, everyone remains at school during the noon hour, eating lunch in the school's kitchen-dining room. In addition to supervising the lunch tables, the teachers coach games during recess, organize special programs, and, near the end of the school year, prepare and rehearse the eighth-grade graduation program, in which all the students take part. Ten students were graduated from the school in late May.

Changes are taking place at the little school, but slowly. Until seven years ago, all eight grades were taught in one room by Mrs. Floyd Martin, a veteran of thirteen years with the school. Mrs. Martin now teaches the fifth through eighth grades. Next year, however, the two upper grades will be moved into the Columbia school system, leaving the teachers with three grades each. New Providence compares favorably with the three other rural schools in its district—despite the fact that only this year was a telephone installed. This year the school also received a television set, a record player, and a film strip projector, purchased for $5 here and $10 there by the district's 75-year-old supervisor, surely one of the world's great requisitioners.

Drop into this situation a young woman born and raised in the city; a woman just married and just graduated from the University—with a major in Latin and a minor in secondary, not elementary, education. An impossible role? At first Ellen thought so. "I was sure I'd never be able to do the work, that I'd just never get it all done," she said. "I had never worked before and..."
Members of the third grade at New Providence gather around Mrs. Kalbac’s desk for a lesson in reading and spelling. Other children work at the blackboard or assist their teacher with paperwork. Textbooks and extra materials for each grade are stacked separately on the desk.

Grace before lunch is a tradition at the school and is led by a different student each day. The milk, provided by the federal government, is the only thing the children are required to finish. The remainder of the lunch, including occasional hot rolls, is prepared in the school kitchen by a local housewife.
I didn't think I could do anything like this. But it's worked out well. I just bite off a day at a time. You really never know what you can do until you have to do it."

Ellen confessed that one year at New Providence has probably taught her more than she has taught her children. "I've learned patience and tolerance, and I've been given a taste of life I had never had before. Teaching has taught me to think on the spot, too. I've found that it's not so much what you know, but what you can figure out.

"The work this year has also been a great responsibility. I have been completely on my own, with no principal to answer to and no list of subjects which must be covered. I suppose I could have let the children color every day all year if I had wanted to. The responsibility for all those children was frightening at first."

Because her formal education had not prepared her for a room full of young children at four different grade levels, Ellen found early in the year that she was barely able to keep a few steps, sometimes just a page or two, ahead of her students. She's more experienced now and finds that with a little after-school effort she can prepare each unit at a time. Every afternoon she takes home a box loaded with workbooks and papers to grade and lessons to prepare or review. She settles down immediately and tries to get the work out of the way before time to prepare dinner for herself and her husband, a second-year medical student at the University of Missouri.

Ellen gives credit to her co-teacher, Mrs. Martin, with providing a great deal of assistance and encouragement over the past year. "Actually, Mrs. Martin's getting to school at 7:00 a.m. and working at home until 10:00 p.m., in addition to helping her husband with their farm, makes me feel a little guilty," Ellen said. "She is one of the greatest, most 'educated' teachers I have ever known."

In spite of, or perhaps because of, the rural surroundings, the small schoolhouse, and the unfamiliar work, Ellen has enjoyed her first year of teaching. She has renewed her contract for the coming year and will receive an increase in salary from $3600 to $4000. "Of course the job means more to me than the money. It has to mean more. But I would rather stay here next year. I would rather be where I am appreciated. And you can tell after just one day that the children are wonderful."

Ellen came to Columbia last fall, a few months after her graduation and her marriage to Richard W. Kalbac, AB 66. At the time her husband was entering his second year of medical school, with the prospect of three more years of near-round-the-clock work and study ahead. Partially because she knew she would have time on her hands while her husband studied, and partially because of her own drive and ambition, Ellen began looking for a job in the field she had prepared for—teaching high school Latin. "I went to school—through college for four years—and I thought I should do something to make all that time, money, and effort worthwhile. I wanted to use my brain and not just sit at a desk answering the telephone." Because they have a private income, she did
All the children of the school participate in the May graduation ceremonies for the eighth grade. Mrs. Martin is the accompanist while Ellen leads the singing.
not have to work to help support her husband's studies.

Appropriately enough, the Kalbacs met in a Latin class at Washington University. Although her high school education in Latin had placed her at the third-year level, Ellen chose to drop back to second-year courses for her freshman year. Richard Kalbac, then a sophomore with pre-med ambitions, was polishing up his Latin for future use. Near the end of the first semester, they began dating, then went together throughout their school years, becoming engaged in June of 1966, when Rich was graduated. The couple saw each other on weekends for the next year while he attended the University of Missouri at Columbia and she finished her senior year at the University. They were married in June, 1967.

Basically, Ellen Kalbac is not a woman who enjoys doing the ordinary thing. She decided on a Latin major because she wanted to be different from all the girls who study English. She settled on the formidable-sounding area, too, because of the teasing by Rich that most women come to college simply to find a husband. She was out to prove him wrong—at least in her case.

Elementary education was the other area which interested her, but because it was incompatible with the teaching of Latin as a high school subject, she took a minor in secondary education. After a year at the New Providence School, however, Ellen wishes she had taken the courses in elementary education. She added that she will probably never return to Latin or to secondary education.

Arriving in Columbia in mid-September, Ellen found that the few high school positions in Latin were filled by career teachers and would probably remain closed indefinitely. Inquiries for full-time, interesting work at the University of Missouri also drew a blank. The Columbia schools had already opened and Ellen was becoming discouraged when she heard about the rural school system. The single available opening—then being filled by a temporary teacher—was at New Providence. Ellen was invited to visit the school to see if she liked it and could handle the work. She spent a week working into the job with the temporary teacher, and then decided to try it for a year. Since then, she has been on her own with the children.

Certainly there are pros and cons of teaching, and in many cases they are the same regardless of the school's location. One of the major assets of New Providence is the individual attention given to the students. With only eighteen pupils in her classroom, Ellen is able to work closely with the children of each grade—there are three, four, five, and six pupils, respectively, in the first, second, third, and fourth grades. The results are encouraging. Checking the progress of her first-graders against a class in the St. Louis area, Ellen found that her students had long since covered the subjects being studied in the city school. Ellen works well with the children but admits to a certain lack of communication with the second grade, "due, I'm sure, to some lack in me. They are too young to do the more advanced work and yet too old for the basics."

Ellen considers her major problem to be a lack of motivation in many of the children. To her, many seem unconcerned about learning or accomplishing anything—a situation possibly stemming from a lack of interest at home. One indication of this lack of interest is the fact that seldom is a paper carried proudly home for mother and daddy to see. If a paper is not something which will be put up in the classroom, it almost invariably ends up in the trash can.

Perhaps because of her Cincinnati upbringing and an unfamiliarity with rural ways, Ellen senses contrasting attitudes toward the school as a social center for area families and as an educational center for the children and their parents. Although the school is filled with 99 percent of the parents at Christmas and graduation and at country-style box suppers throughout the year, PTA meetings usually draw only a few parents.

Some parents have voiced their concern for their children's futures. Yet Ellen can recall only one father saying that he wants his children to go on to college. The situation is borne out by the history of New Providence. Only one student has gone on to a two-year college. Never has a student of New Providence attended a regular four-year college or university.

These are the facts of life of New Providence—some good and some bad. But somewhere between explaining "15 take away 9" and reading book reports, Ellen has found the things worth working for.

"Being here this year, I think I've made my mark in life," she said. "Even this early in my life. A schoolhouse like this is a dying-out thing in our country. I feel privileged to be in on it for a little while."
An ethologist is a scientist who studies the movements and expressions of animals in an attempt to learn the language or mechanics of their communication systems in order to gain some insight into their feelings and motivations. Professor Fox, who earned his degree in veterinary medicine and his Ph.D. from the University of London, discusses some of the insights ethologists have gained about many species of animals—from fish and birds to Man.
THE ETHOLOGISTS

AND THE NAKED APES

"Oh how nice—a costume party," exclaimed Cynthia. "Let's go as Naked Apes, John." "No," he retorted, "your nakedness would cause a riot of conflict and displacement behavior in frustrated males and rivalry in the other females. Anyway, I might find myself in an ambivalent state between my territorial imperative to defend you in a strange place amid potential rivals and my basic sex drive, which could result in an embarrassing if not aggressive, display." Cynthia smiled, poured her mate fresh coffee, and after further verbal exchange, they decided to go as Bonnie and Clyde.

The next evening found John and Cynthia in a house exactly the same as theirs, save for a few minor details. However, being in a strange territory and amid strangers, everyone was ill at ease. The anxious, over-attentive host, to ease the tension, poured drinks and provided morsels of food; mutual drinking, nibbling, and smoking (socially-facilitated anxiety-relieving displacements) began and chit-chat party talk (meaningless, but purposive stereotyped rituals) started to flow.

The party was not a success, however, in spite of social rituals and tension-relieving displacement and in spite of the apparently submissive non-territorial defensive behavior of the hosts, because ten couples came dressed as Bonnie and Clyde, while the host and hostess were robed as Anthony and Cleopatra. (Another couple, Rodney and Charles, came dressed as Jekyll and Hyde.) Small groups could not form because of mutual similarity; instead, an amorphous herd of Bonnies and Clydes mooed and slurped and chomped all night.

The next morning, as Bonnie poured Clyde a third cup of coffee, their individuality slowly separated from the amorphous ventures of the previous night. "Perhaps, Cynthia," said John, "we should have gone as Naked Apes anyway."

These phenomena have been studied by ethologists in many species, from fish to man. To be told that fragments of some aspects of fish behavior are also present in man usually produces an outcry from the arrogant ape. However, we have much to learn about our own nature—the phenomena of man—and embedded in many of these complex behavioral and social phenomena we can recognize the basic form or structure, uncomplicated by cultural influences, in "lower" animals.

The term "ethologist" was coined to describe a person who studies the movements or expressions of animals, both comparatively and developmentally. Animals employ a number of non-vocal as well as vocal signals or expressions for communication and the ethologist attempts to learn the language or mechanics of the communication systems they use. Such knowledge may provide information about the evolution of signaling devices—the use of display structures and ritualized movements in different species—as well as some insight into the feelings of the animal and what motivates it internally.

A motivational analysis can be made and the behavior predicted once the observer knows the animal's repertoire. He makes a list (or ethogram) of the various patterns, the conditions under which they occur, and the stimuli which evoke them. The work of Von Frisch on the language of bees—the various dances which contain information that enables the colony to find a particular food source—is a classic example of ethological methods.

The founding fathers of ethology, notably Heinroth, Huxley, Tinbergen, and Lorenz, studied animals in their natural habitats. The adaptive and purposive aspects of behavior, in relation to ecological factors and seasonal changes, were examined; social organization, cooperation, and seasonal changes associated with territorial, courtship, parental behavior, and migration were studied. The student of ethology became extremely familiar with his subjects under natural conditions. The studies, involving many years of painstaking observation, were as objective as possible. Since these earlier years, laboratory studies have supplemented field observations, but by no
A number of important contributions have been made by ethologists in advancing our knowledge of the behavior of both human and sub-human species.

Many complex activities are unlearned or innate; they are inherited and are in effect literally wired in. Such activities, which are often specific to certain species, are termed "fixed-action patterns." They are not so fixed or rigid as the definition implies, but can be modified occasionally by experience or learning.

A newly hatched herring gull chick, for example, will peck at the red spot on its mother's beak. This innate response is subsequently reinforced with food from the mother. Ethologists use models of certain stimuli to investigate these innate responses. A red pencil marked with three or four white bars will elicit more pecking than a normal yellow beak shape with a red tip: this is a "supra-normal" stimulus or "releaser." A male stickle-back or English robin will attack a model that has a red breast; this red breast is the releaser for aggression during the breeding season when rival males develop bright red breast patches. Many species of birds will leave their own eggs and attempt to brood artificial eggs that are three or four times larger than normal or are more brightly colored. These are supra-normal releasers. Depending on cultural and economic influences, the human female will emphasize (or de-emphasize) certain body structures that may become supra-normal sex releasers.

Responses to some stimuli are learned, but they may become rather automatic and are responses to acquired releasers. The practices of commercial advertising and design employ the use of supra-normal releasers to attract potential customers. Vegetables are colored with dyes, many foodstuffs are packaged in attractive cartons to emphasize palatability, hygiene, and freshness, but in fact, they are undoubtedly not so fresh as the less visually attractive country market products. Advertising and consumer production research have become fine arts in a highly competitive commercial arena and can actually create a market. Add to this the conditioning of the consumer by repetitive audio-visual advertising propaganda, and we can see how human behavior can be directed, if not controlled and manipulated.

Design of clothes, buildings, and utensils incorporates more to the basic functional or utilitarian structure by adding esthetically pleasing, if not superfluous, additions. Again these may act as releasers and attract the consumer. The automobile represents the all-time-best-selling supra-normal releaser. No longer a box on wheels, it is a baby to care for, a mistress or lover to indulge, a womb to be comfortable and safe in, an aggressive or status symbol to redirect or sublimate one's frustrations or to display one's prosperity. Until automania became so widespread, it was also a convenient means of transportation. The reader at this stage will feel a strong Freudian undertow in this interpretation. Be that as it may, a releaser is attractive and is a releaser if it provides an adequate source of stimulation for some particular need, desire, or motive.

Architecture, however, is more complex. Some elements common to our own dwelling must be incorporated in the design of new surroundings to make us feel at home. (The empty fireplace or the pseudo-fireplace in centrally heated American homes amuses the coal-burning English.) Designs for "modern living" must also consider man's need for an individual, i.e., distinct, territory or home; a row of identical boxes provides not a unified utopia, but an isolated and cold suburbia. Man must have privacy, a means of retreat or escape into his home, and in man, self-identity and "home valency" are strong. Qualities of good architecture should release feelings of strength, durability, and atmosphere related to the design, as well as provide for the physical, utilitarian needs of the species.

A number of ethologists studied the innate displays of animals and discovered that in many species of fish, reptiles, birds, and to a lesser extent mammals, the ruffling of feathers, the display of colors, and the erection of body structures, such as fins, often coupled with vocalizations, are used in advertising and defending territory against rival males and in courting females. Such social displays may act also as sign-stimuli or releasers. In courtship cere-
monies, the male's display to the female can bring about not only synchronization of the pair's behavior, but can also cause hormonal changes within the female which make her more receptive.

Some behavior patterns may undergo what is called emancipation and ritualization. As a result of evolution, a behavior pattern from one motivational context may shift to another and become highly stereotyped or ritualized as a species-specific response. It is thought that the smiling response in man may be an emancipated pattern derived from a threat gesture of some primordial ancestor. Some monkeys today show a human-like grin that is, in fact, a threat gesture. Konrad Lorenz has shown that the "triumph" greeting ceremony in the graylag goose is a ritualized, emancipated threat gesture. He was able to follow the evolution of this pattern by comparing the behavior of various species of ducks and geese.

Another example of the phenomena that the ethologists have revealed is displacement behavior. When an animal is thwarted from doing one thing or is in some conflict, he may suddenly begin to do something completely out of context. For example, two male birds at the edge of each other's territories may vacillate between attacking each other and withdrawing. Suddenly, as a result of this conflict, they start to preen themselves or to peck the ground as though they were eating.

Such familiar activities may serve to reduce anxiety of conflict and provide a socially acceptable outlet for dammed-up energies, which are rechanneled by displacement. We are reminded of the nervous speaker who shows such stereotyped displacement activities as head-scratching, rocking, and pacing, which may persist in later years as rituals, even though he is now quite confident. Apprehensive strangers become more at ease as they engage in familiar anxiety-reducing displacement activities. As each begins to do the same thing at the same time, social facilitation also occurs. When the drinks are poured or the food is presented, the silence ends and everyone talks at once.

Ethologists have found that young animals have a critical period early in life when they most readily develop an emotional or social attachment to their own species. In the chicken or duckling this occurs during the first few hours after hatching; in the dog between the fourth and eighth week of life; and in the human infant between three and seven months of age. This is the period in which primary social relationships, with peers and family, are made. In these three species, a "fear" period also develops towards the end of this critical period when strange or novel stimuli suddenly evoke fear or avoidance. This fear period may actually help to consolidate the attachment established earlier between the parent figure and the offspring.

The termination of this latter period has not been established. As a result of learning (habitation) the developing animal learns what to approach or avoid on future occasions. Also on the basis of social bonds established during the initial socialization period, subsequent (secondary) social relationships are formed: an echo of Freud again. However, it has been shown in many species of birds and ungulates that if they are hand-raised and imprinted or socialized to man only, they may show in later life a sexual preference for human beings.

This example of socialization dramatically illustrates common biological phenomena in the behavioral development of three widely separated species. Further studies on the development of the brain and behavior of the dog have revealed other close parallels with development in the human infant. Such fundamental data provide a basis of experimental manipulations of the developing animal, so that models of human disorders such as infantile autism may be established and investigated in greater depth than is possible in the human species.

It is clear that the ethological approach to animal behavior is applicable to the study of human behavior. The additional complications of culturally acquired phenomena are not restricted to man; similar phenomena are also seen in the non-human primates and constitute not a limitation but an added perspective to the ethologist. We tend to forget that the human primate, with deep-rooted ancestral connections with sub-human species, although differing in linguistic and intellectual capacities, is still a naked ape.

Our ancestral foundations are not barriers or obstacles to be overcome, as many writers and alleged authorities believe; they are the foundation stones, the biological roots of our very nature. Once we can recognize and possibly control these phylogenetically older elements, the present schizophrenia of our socio-technological evolution, which has far outstripped our socio-biological evolution, may be eliminated.

Many of the problems of homo sapiens, such as aggression, lie in the biological sphere. The socio-biological revolution is now beginning. A knowledge of our social and biological capacities and limitations may provide the leads for instigating the necessary reforms or directions of adaptive modification to match our apparent technological advances on both the intranational and international plane. We may then become homo splendens.
The tension before a Le Mans start is different from emotional stresses found in any other sport. The hubbub and chatter of the pits ceases and an expectant silence creeps like the shadow of a storm cloud around the track, enveloping little clusters of racing aficionados who have staked their claims to the best curves hours before the green flag falls.

That's how it was on Saturday, April 27, for the second annual running of the Grand Prix d'Architecture on the Washington University campus.

The machines, oiled and adjusted to perfection, sat gleaming in the afternoon sunlight, emanating malevolent power although their motors were elsewhere, sipping last minute draughts of pre-race fuel from beer cans in the pits.

Sponsored by the School of Architecture as the premiere event of Architecture Week, the chase of man and machine around the treacherous Olin Library circuit was all that Grand Prix racing should be.

Four of the nine entries featured drivers in the sleeping position. The radical entries came from the sponsoring group—all three Architecture cars featured enormous rear wheels, either lent by or stolen from the Medical School.

There was some snickering at the architects' wheelchair-shaped cars but the builders of tomorrow had the last laugh and sneers turned to gasps of amazement as the high-wheelers left the starting grid. The Architecture cars drew good starting positions and led the pack from the start.

The architects' strategy was simple: get out in front and stay there. They executed motor changes with a fluid grace usually seen only in the pits at The Brickyard. The Architecture drivers conducted a conservative race, avoiding foolish demands on machines or motors. For a while there was some thought that they might drive for a deliberate tie but the lure of the winner's prize was too great and Dennis Bolazina piloted Fourth-Year Architecture's entry past the checkered flag for the victory.

The Queen of the Grand Prix was present to greet the winners in Victory Row, and a bottle of champagne foamed from hand to hand as drivers and motors alike shared in the bubbly fruits of victory. The runners-up celebrated with beer while the losers, race-weary and worn, retired from the field to redesign their machines, train a new set of motors, and plot their strategy for next year.
Fourth-Year Architecture's entry led the pack into the West Olin hairpin turn. Two philosophies on driving position were displayed by the teams battling for the second position.

A study in concentration and pain. Motors were changed every half-lap while drivers controlled their cars for a full lap. As at Indianapolis, the sponsors saw fit to outlaw turbine cars.
Pit stops for motor changes reflected a variety of techniques. This one was accomplished with record speed, thanks to the exuberant assistance of a canine member of the pit crew.

With a comfortable lead and a fresh motor, this happy driver performed a "wheelie" leaving the pit. Such a manoeuvre is usually confined to drag racing.

Let no one doubt the grueling intensity of Grand Prix racing. Here, a used motor was removed from the pit area. By the end of the race the course was strewn with the hulks of exhausted motors.

The triumph of man and machine! Victory Row was complete with the traditional trappings of Grand Prix racing—a pretty girl and a bottle of cold champagne for the winners.
Grand Prix d'Architecture
I n the palm y days of my undergraduate years at Wash­
ington University, then known as a "trolley college," World War II was being fought, but for the student, life in general seemed serene and satisfying. Perhaps we were not with it in grappling with the Great Problems of life.

One of our Great Problems was whether Jimmy Conzelman would succeed in dragging the Bears kicking and screaming into Big Time football. Education was going to be the answer to everything: If we could just educate enough people, the Great Problems would somehow take care of themselves.

Since those days I have married, reared a family, done battle with moderate success against the vicissitudes of life, and am ready to say without fear of contradiction that Jimmy Conzelman did not succeed.

The Great Problems are still with us, but I didn't realize how much so, in my quiet little world, until the spring issue of the Washington University Magazine arrived. Its message overwhelmed me, and I found the Great Problems had grown considerably.

Since I occasionally have shortness of breath, dry cough, palpitation, chest pains, night sweats, and a host of other discomforts too numerous to mention, I find that I am probably a prime candidate for either anxiety neurosis, the St. Louis disease, or both.

To my horror, I read again that the old school must raise $6,000,000 a year to remain a quality institution, that the plain fact is that all higher education in the private sector is in trouble, and that our best hope from an exotic death is the dull, dreary United Nations. Add to this that amateur revolutionists are being spawned on the campuses, that the plain fact is that all higher education in the private sector is in trouble, and that our best hope from an exotic death is the dull, dreary United Nations. Add to this that amateur revolutionists are being spawned on the campuses, and that students either don't fit in or don't trust anyone, and the whole outlook is dismal. Thank God, the revolution in biology is a peaceful one.

The editors have cleverly arranged the articles, so that if one begins reading from the front cover, a habit not widely shared by magazine readers, he is perhaps unaware of the grim blockbusters awaiting him.

Certainly the "Recent Revolution in Biology" is not designed to make the old grad break out into a sweat and flip on a rerun of "I Love Lucy" just to get away from it all for a harmless thirty minutes. It was refreshing to learn that DNA was not, as might have been suspected, an abbreviation for another government superagency, but good old deoxyribonucleic acid. In fact, Dr. Kornberg gave cheerful assurance of the correction, in time, of genetic defects and diseases caused by defective or missing genes.

But from then on, things were pretty much down hill. Those nine students picked as samples of life and thinking on the Hilltop certainly were ample evidence of the national look now prevalent at Skinker and Forsyth. Only one was from St. Louis.

And how did that one poor chap sneak in there? He actually likes his father. Of course, he recognized his heresy by conceding that "this may sound corny." There was some solace for us old gaffers from the fellow who wanted to go back to the America of years ago when things weren't so "dirty and crowded." I thought about that and tried to pick out a more suitable time in history.

First I considered the turn of the century, when diphtheria and pneumonia were still dread diseases and slums were taken for granted. But that just didn't seem to fill the bill. I went further back to 1861-65, when Americans were killing each other with abandon. Nope, that wouldn't do. I decided to come the other way, to those happy breadlines of the 30's and Al Capone. Well, 1620 should have been safe enough. Cold, perhaps, and tougher than hell just trying to get through the winter with the help of the Indians, but certainly not dirty and crowded.

As a respite, apparently, from the trials and tribulations of an errant society, the editors saw fit to treat their readers to a gentle piece on the amateur revolutionists springing up on the campuses. It was a rather hopeful thing, suggesting that the amateur revolutionists, disenchanted with the world of their parents, could turn to professional social science.

My generation protested, too, but the forms were more immature, like party raids and goldfish gulps. Perhaps the spring madness that infects almost every campus is taking a more permanent and serious turn.

I found "Revolution and Amateur Protest" a most refreshing breeze across a forbidding landscape of type designed to chill the hearts of the hardest readers. But after this somewhat encouraging treatise, things got scary again. I was reminded that private education is on the ropes and somebody had better start cooking up the dough or everybody will wind up going to state institutions of higher learning.

L et's turn to something more cheerful like anxiety neurosis. I just don't like those symptoms; they scare me to death—inward shakiness, tremor, tingling sensation in the skin, vascular throbbing, and palpitation. It used to be called love, now it's anxiety neurosis.

But if you don't like that analysis, try the St. Louis disease, histoplasmosis. How do these symptoms grab you? Shortness of breath, chest pains, general feeling of malaise. Well, that shoots the day: I've got one or the other.

But those editors are deucedly clever. The United Nations story was sandwiched in to make me realize that despite my poor physical condition there was hope that the world organization would, despite its dullness, come to grips with and solve the Great Problems.

Well, it's reassuring, let me tell you, and I just hope I can keep functioning until the next exciting issue of the Washington University Magazine.
Lintels. Beams. Arches. Walls. These architectural terms are accepted and without them, and the devices they define, our cities would look vastly different. Why shouldn't our cities look vastly different?

This is the question asked by Richard Larry Medlin, visiting professor of architecture at Washington University. To answer this question, Medlin, working with seven graduate students, has built a pair of experimental structures which now stand in the South Forty residence hall area.

For the seven students, the two Experimental Tension Structures represent months of labor in lieu of the traditional master's thesis.

Each structure will be used to test extensively the theories propounded by Medlin that cables and membranes under tension exhibit greater inherent strength than other materials which used in traditional fashion, are bearing their loads under compression.

Aside from the functional aspects, the structures provide high visual excitement in their setting in the South Forty's leafy glade.

What is the future for such structures? Medlin, who studied under German architect Frei Otto, who was also a visiting professor at the University in 1959, and helped design and construct the West German Pavilion at Expo 67 in Montreal, says the structures offer the advantage of mobility, ease and speed of construction, and low-cost removal.

It doesn't require a mystic's powers to foresee the modest pair of tension structures on the University campus as the forerunners of a seriously accepted architectural form of the future.