

Dividend

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*Key to the
Oak Island Mystery*

Dividend

The Magazine of the Graduate School of Business Administration

Volume II, No. 3

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What is in the Money Pit at Oak Island? 4

Several lives and at least one million dollars have been lost in an attempt to answer that question. Now Ross Wilhelm, associate professor of business economics at the Graduate School of Business Administration, has cracked the code written on the stone and thereby arrived at a plausible explanation for the 200 year old mystery.

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Our Director of Alumni Relations writes on plans to develop the Business School Alumni Association.

About the Cover

Our cover is a picture of Porta's Wheel, a mechanical encoding and decoding device described in a book on cryptology published in 1563 by Giovanni Battista Porta. For instructions on how to use it, see pages 6 and 7. The wheel was used by Associate Professor Ross Wilhelm to decipher the mysterious symbols found engraved on a rock in the "money pit" at Oak Island. The picture is taken directly from Porta's 400-year-old book which is in the rare book collection at the U-M.

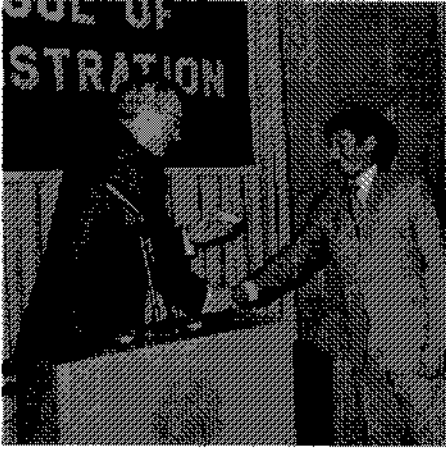
Honors Banquet

Asa T. Spaulding, former president of North Carolina Mutual Life Insurance Company, received the 1971 Business Leadership Award following the annual honors banquet held March 19 at the Michigan League. Pictured are some of the people at the banquet:

- a. Viji Santhanam received the highest MBA award from Dean Floyd A. Bond. His grade average of 8.14 was between an A and an A+.
- b. The Alexander Perry Awards (for the best papers on investment) were given to (from right) Thomas P. Kurlak (first place), Mike Royster (third place) and Ted Barnhill (second place) by James Pilcher, professor of finance.
- c. Paul A. Yhouse received the Alpha Kappa Psi award for the highest BBA grade average from Robert Doty, president of Alpha Kappa Psi.
- d. At the reception before the dinner were (from left) Raymond T. Perring, Chairman of the Board, Detroit Bank & Trust Co.; Ray T. Parfet, Jr., Chairman of the Board, The Upjohn Company; Asa T. Spaulding, recipient of the 1971 Business Leadership Award, and Dean Bond. Mr. Perring and Mr. Parfet are both members of the School's Visiting Committee.
Among banquet guests were:
- e. Regent and Mrs. Lawrence B. Lindemer.
- f. Former regent Frederick Matthaei and his son, Frederick Matthaei, BBA student, chat with Mrs. J. Philip Wernette.

Photos by Robert Williams

a.



b.



c.



e.

d.



f.



What is in the Money Pit at Oak Island?

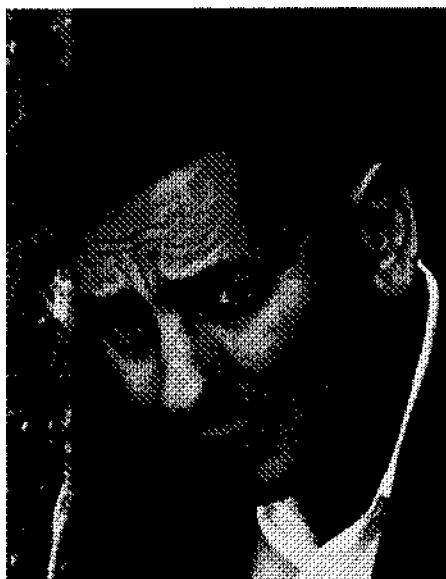
To answer that question? decipher this message. Ross Wilhelm did.

How much treasure lies buried deep beneath the surface of Oak Island, a tiny land mass off the coast of Nova Scotia? Who built the 200 foot deep main shaft and its connecting tunnels, a project that may have taken hundreds of men at least two years to construct? Does it guard pirate loot, French treasure, Inca gold? Why did the tunnel fill with water after diggers reached a certain depth? What is the meaning of the mysterious symbols found carved on a flat rock about 80 feet down the shaft?

Several lives and at least one million dollars have been lost in attempts to answer these questions and get at the huge treasure believed by some to be buried in the "money pit" on Oak Island. Now Ross Wilhelm, associate professor of business economics at The U-M Business School has cracked the code written on the flat stone and thereby arrived at a plausible explanation for the 200 year old mystery.

The "Oak Island Mystery" was born in 1795, when three young men found a depression in the ground under an old oak tree on the Island.

A rotting ship's pulley hung on a limb of the tree directly over the the depression. When the three started to dig, they uncovered a shaft about seven feet in diameter, the sides of which were clearly defined. Ten feet down the shaft, a platform of oak logs was found, and another



Ross Wilhelm

platform at 20 feet. When the searchers reached a depth of 30 feet, they decided to seek help before continuing. Work was not resumed until about seven years later, when the original three diggers and other backers dug to a depth of about 80 feet, where they found a flat stone carved with a coded inscription. The stone has since been "lost," although the code has been written down from memory. Some years ago, a professor of languages at Dalhousie University in Halifax examined the code and said it meant, "Ten feet below are two million pounds buried." The remembered code is written above.

At 90 feet water began to show in the pit and at 93 feet it increased. The diggers decided to stop work for the day, but before leaving the pit they probed the bottom with a crowbar which met with a hard substance at 98 feet. When the diggers returned the next morning they found the shaft filled with sixty feet of water. Every attempt to bail it out failed, and the treasure seekers finally gave up.

In 1849 another company tried drilling for the treasure. One of their workmen fell into the shaft, discovered that the water was salt, and deduced that it must come from the sea. Accordingly, the beach at Smith's cove 520 feet to the east of the shaft was searched.

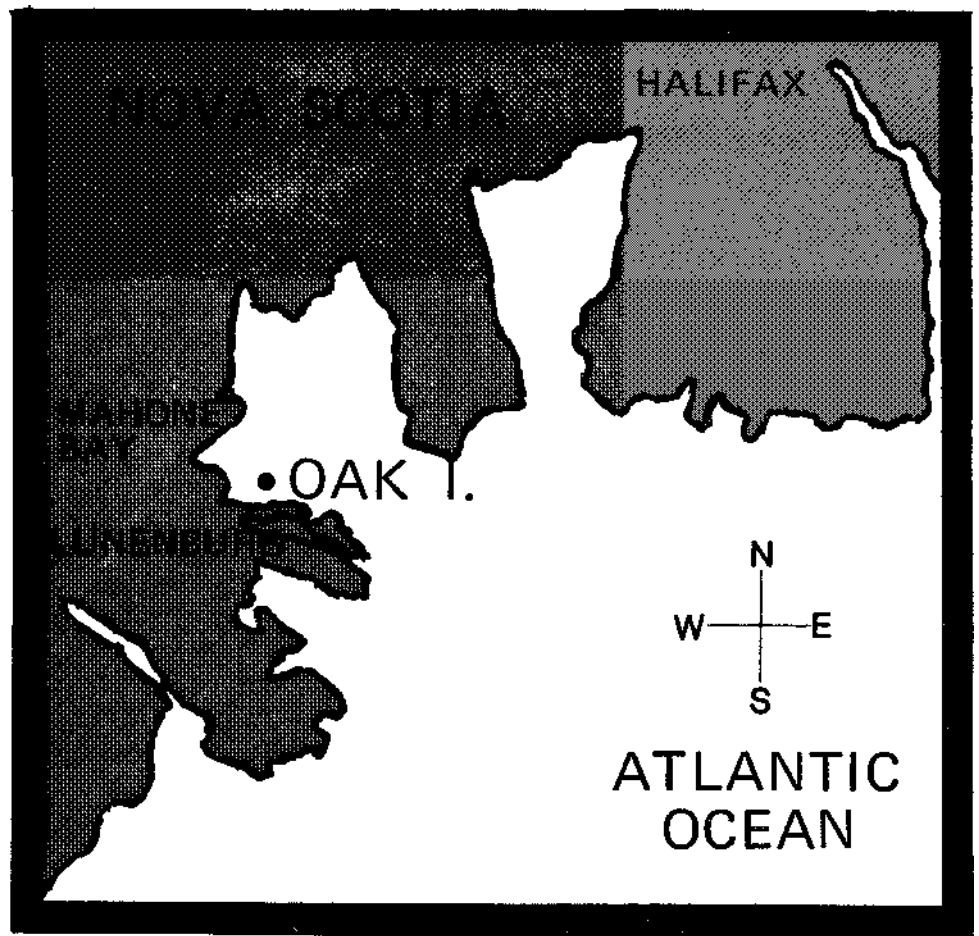
At Smith's cove five man-made drains were found which reached down the beach to the sea like the fingers of a hand. Above the beach they converged to a single downward drain that fed an underground tunnel. The drains were made of hand fitted flat rocks, and filled with stones to make sure they wouldn't collapse. Rocks also filled the ground between the drains. On top of the drain system was a layer of rotting eel grass, and on top of that a two-inch thick blanket of coconut fiber, tons of it, which acted as a filter so that the drains would not silt up. Two feet of sand hid the system from view. The drains fed an underground tunnel which led directly to the shaft of the "money pit." No wonder the shaft kept filling up with water. It had an unlimited source of supply—the sea!

Who Built the Pit?

Some people believe that the pit and its complicated drain system was built by pirates, perhaps Captain Kidd himself. All pirates of the 17th century were very familiar with Nova Scotia and indeed, a composite map drawn from fragments found among Captain Kidd's papers does look like Oak Island.

Another theory has it that the French, whose military capital was at Louisburg, Nova Scotia, secreted treasure on Oak Island to keep it safe against the possibility of a British invasion. Still another theory holds that the money pit contains Inca treasure from the fabled golden city of Tumbes (Peru), sent there by the Incas to protect it from the rapacious Spaniard Pizarro.

Ross Wilhelm's solution of the coded message found on the rock suggests a plausible reply to the question "Who built the pit?" Answer: "None of the above."



From time to time over the past two hundred years, various companies have been formed to try and find the treasure. So much digging has been done that from an archeological viewpoint the Oak Island treasure area probably never can be completely reconstructed. For example, there are other means whereby sea water from the bay enters the digging area. It is not clear, however, whether these sources of water are other man-built tunnels similar to the drains found at Smith's Cove or whether they are a consequence of the extensive use of explosives in past digging efforts or of the digging efforts themselves.

Among those who tried to solve the mystery in the 1960s was Robert Restall, who moved his wife and two sons into two shacks he had built for them near the pit, spent an estimated \$100,000 in five years, and was finally overcome by carbon monoxide fumes from a gasoline pump he was using in the pit. His son, Robert, 24, and two local workmen went into the pit to help

him and they also died. A few months later, a California petroleum geologist named Robert Dunfield began digging and reached the 148 foot level before being stopped by a cave-in. He returned to California after spending about \$80,000. Now a company called The Triton Alliance, formed in 1969, is again at work trying to reach the money pit. They say recent drilling operations indicate the presence of a large oak lined cave in bedrock, below the area of the original digging.

Ross Wilhelm first became interested in the Oak Island mystery last summer, when he read a story about it in the Wall Street Journal, but he did not see the ciphered message until he ran across a story by Arthur O'Shea, published in the Detroit News last fall. O'Shea's story included the message.

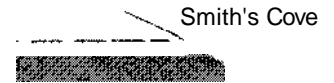
Something about the ciphers looked familiar to Wilhelm, and he soon remembered what. They were very like symbols used in a book on cryptology published in 1563 by



SIDE VIEW

loney Pit

32 feet (tide level)



Tunnel to Smith's Cove-520feet

Water

TOP VIEW

Five man-made drains covered by tons of coconut fibers

loney Pit

Giovanni Battista Porta. How did Wilhelm know about this 400 year old book? He served in Counter Intelligence during World War II, and therefore was well read on codes, their history, and methods of encoding and decoding.

The Cipher Disk

In his book, Porta describes several disks he developed to provide mechanical means of coding and decoding messages. A cipher disk consists of two rings—one inside the other, and each divided into an equal number of spaces. Spaces on the outer immovable disk are inscribed with letters of the alphabet, one to each space. The inner, moveable disk is inscribed with cipher symbols, one to each space. To code a message you

set the inner disk at a prearranged position in relation to the first letter of your message and write down the appropriate symbol. Then you move the disc one space, and write down the symbol that is now opposite the second letter of your message, move it again for the third letter and so on. Thus no symbol stands for the same letter twice. Porta recommended various other ways to make the message secure. Among his suggestions: that words be deliberately misspelled, that commonly recurring letters be dropped, that symbols be used within the code to serve as operating instructions for using the disk rather than as letters in the message.

Armed with his knowledge of Porta's rules, Wilhelm looked again at the code. He noticed that the symbol £ appeared frequently, and

hypothesized that it might be a dividing symbol between words. (This practice of dividing words was abandoned shortly after Porta's book was published, since it greatly weakened the security of any code). If, reasoned Wilhelm, the symbol was a divider, then the first word of the message was only one letter long. There are few words in English, French or Spanish that consist of only one letter, and Wilhelm began trying them out, turning the Porta disk to get the letters in the second word that would be represented by the triangle when you turn the disk the required number of spaces.

For instance, he reasoned that if the message were in English and the first triangle represented "I", then in the second word (turning the Porta disk one space each time) the first

triangle would stand for "K" and the second triangle for "M". There is no such second word which even remotely fits in English. In a similar way it is possible to eliminate French as the language of the code.

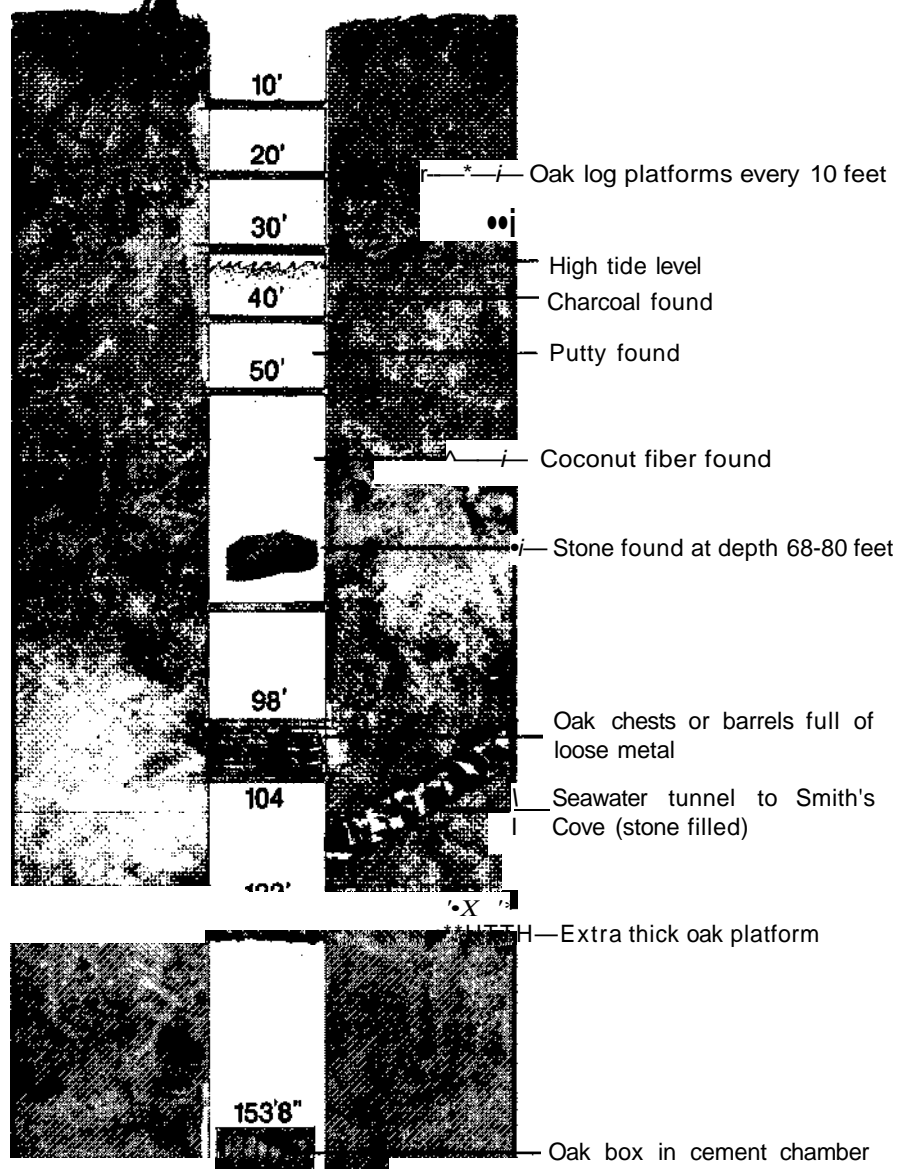
However, in Spanish, if the first triangle stands for "A", then the next triangle would stand for "C" and the third one for "E". Further, if the four dots stand for an operating instruction "turn the wheel eight spaces," then the fourth triangle stands for "N". This pattern of letters fits the Spanish word OCHENTA, and on these assumptions the first two words would be "A OCHENTA" (At eighty).

From there, Wilhelm deduced the following operating instructions for the code:

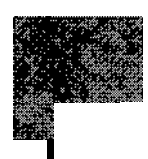
1. If no operating symbol is shown, turn disk one space.
2. If one dot is shown, turn disk one space.
3. If three dots are shown, turn disk three spaces.
4. If two dots are shown above each other, turn disk four spaces.
5. If four dots are shown, turn disk eight spaces.
6. Ignore any symbol enclosed in a circle. It was introduced for confusion.
7. If the last letter in a word is omitted (as is the case in three of the words in the Oak Island message), turn the disk one space to indicate the omission. If a letter is omitted from within a word, act as if the letter were not present.

Wilhelm believes there are two differences between the remembered version of the message and the correct version, which can be explained either by erosion of the symbols on the stone or by failures of memory. In any case, the differences are 1) the second set of three dots in the fourth word should be four dots and 2) the single dot in the sixth word should follow the O instead of precede it.

With these facts, and your handy Porta disk, you should now be able to decipher the message. We suggest four Spanish dictionaries to help you. At any rate, that's the number Wilhelm used. If, however, you don't want to decipher the message on your own, turn to page 26.

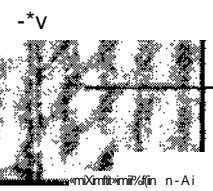


]]SiEttllj|^rihAj(E3&&twwwwfllr"?l *j\$&\$*



.Iron plate
-Depression 30' by 50' filled with clay sealant poured from the surface

tf*.



-*V
Triton group claims to have found, at 30 to 40 feet below bedrock a cavern lined with oak which can be carbon dated to 1580 plus or minus 85 years.

...ma-JU..

mXmibmifd/n n-Ai

r~S

~WT

1 1/7"

~B

What Happens to workers when They Lose Their Jobs:

By Edwin L. Miller
Associate Professor of Industrial Relations

A review of *Termination: The Closing at Baker Plant* by Alfred Slote. Bobbs-Merrill, N.Y.

Termination is an intensely absorbing account of the events associated with a social emergency—the closing of a 300 man paint factory in Detroit. Alfred Slote, the author, reports how the employees of this plant reacted to the emergency, and the price they paid in the course of adapting to the loss of their jobs.

Plant closings, technological obsolescence and automation present workers with the prospect of unemployment and the possibility of radical change in their careers and lifestyle as well as their hopes for the future. How do workers cope with job loss? What effect does the loss of employment have on the worker's well being? This book gives the reader some insights into these questions.

It is only recently that the influence of the social psychological environment of the workplace on the health of employees has come under investigation. Dr. Sidney Cobb of the Institute for Social Research of the University of Michigan has concerned himself with the study of health problems associated with job loss in middle life, and this book is a product of that research. While Dr. Cobb studied the workers at the

Baker plant to find out whether their health was affected by the announcement that they were going to lose their jobs, Slote reported on the experiences of the employees and how they coped with the impending closing of Baker.

The decision to close a plant and terminate the workforce is not one to be taken lightly. Although a firm may act in good faith toward its employees by meeting its legal and financial obligations, the author points out that a plant closing can be viewed as a catastrophe for the worker, and in a real sense the problem will not be limited only to the worker and his immediate family; it becomes a problem having implications for the community, its agencies and its resources.

Slote went behind the decision to close Baker, and sought out those who were involved in the making of the decision or were affected by it. His investigation was not limited to the blue collar workers, but also included parent corporation

management and local plant management as well as local and international union officialdom. He reports for us the strategy and tactics of the corporate planning sessions, the dispassionate attitudes of the international union staff, the mood of the union negotiations and the arguments and interplay of the workers in the paint shop. What makes this an absorbing book is that very fact—the accounts of the participants as they offer their different interpretations of the events leading up to the closing of Baker. The author has done a masterful job of breathing life into the various personalities who were party to the closing of the factory. Slote is more than just another researcher and reporter, he is a skilled and perceptive writer. Based upon his ability to probe the participant's recollections of the events associated with the abandonment of Baker, Slote weaves an engrossing story. This reader had the distinct feeling that he had a ringside seat to the unfolding of an intensely moving human drama.

For example, Slote traveled to "Booneville," Arkansas, to interview 63-year-old Frank Robertson, who was

"Fd lie there in bed and go over it again and again, what had happened, why Yd done what Fd done, would I do it again? Could I have done it differently? Some nights would be worse than others. The nights were always worse than the days"

the plant manager throughout the closing. Robertson kept the plant producing and making a profit for two years after the men knew it was going to be shut down. During this time he suffered extreme weight loss (from 164 pounds to 116 pounds) and at the end he suffered pain and fever attacks. Now retired and living in rural Arkansas, Robertson tells Slote: "This acre of ground outside. It was a patch of weeds and a godsend. I worked on it from dawn to dusk when I first got here. I worked on it trying to shut the long and sordid story of the closing out of my mind. But at night it would catch up with me. I'd lie there in bed and go over it again and again, what had happened, why I'd done what I'd done, would I do it again? Could I have done it differently? Some nights would be worse than others. The nights were always worse than the days."

Termination is more than a highly interesting story. It provides examples of the behavior of men as they adjust to the realities of job displacement in their middle and later years. Some tried to change their environment by whatever means came to hand. Others tried to change themselves—to improve their skills and seek out new opportunities. Still others simply refused to acknowledge that the plant was going to close. But however the men tried to deal with job displacement in a psychological sense, their physical illnesses skyrocketed.

Dr. Cobb's preliminary data on the health of the Baker employees is incorporated into the book. Of the 54 men still left in the study, the Baker closing and its immediate

aftermath precipitated 3 cases of ulcers, 8 cases of arthritis, 5 cases of hypertension that required hospitalization, 2 cases of fluctuating high blood pressure, 6 cases of depression requiring medical care, one case of alcoholism, and three industrial accidents suffered by men in new jobs they disliked. Yet these data fail to tell the extent of despair, humiliation and frustration experienced by the men's families, disrupted family relationships, wives becoming the sole source of family support, increased illness among family members, and in a few cases, divorce. Similar conditions were not found in the control groups.

Not all of the men were crippled by their loss of a job. For example, Glen Littler, a former kettle operator at Baker, used his three week vacation time to take a truck driving course. When he was laid off, he was employed the next day by a trucking company. "I should have got out of paints fifteen years ago," he says, . . . "Now I'm away from the fumes, I don't have to moonlight and I'm making more money than I ever did before. Listen, Baker did me a favor by closing."

Slote concludes that the difference between success and failure to cope with a changed environment seemed to lie in a mixture of luck, job skills, the kind of wife a man had, his age, intelligence and emotional makeup. Cobb's study points out

that while it helps to have marketable skills, it helps equally to have the kind of personality that can adjust to change. In general, those who had rigid personalities did not fare as well as those who were able to be flexible in their approach to their changing circumstances.

If the loss of a job in a man's middle or late years is a serious social problem, what can be done to reduce its magnitude? Slote reports on Cobb's recommendations, several of which center around unemployment prevention. For example, Cobb says government employment agencies should not refuse services until a man is actually out of a job. "What we need," he says, "are unemployment prevention services in our government agencies helping men make smooth transfers from one job to another." Another way to prevent unemployment, Cobb believes, is for companies to offer, instead of severance pay, a 60 to 90 day period during which a man may have a certain amount of time off for job hunting and during which he may quit any time he gets a new job. "Severance pay," says Cobb, "is used by the company to persuade the men to remain on the job until the last day. This is usually not in the best interests of the worker." He would like to see companies bend their efforts toward helping the men get reemployed. Cobb would also like to see health insurance carried forward six months after a closing, or until a man has been employed in a situation providing coverage. The Baker study shows that health expenses went up during the six months after the plant

continued on page 18

Editor's Note: Sidney Cobb's interest in psychosomatic illnesses began when he studied the epidemiology of rheumatoid arthritis at the Harvard School of Public Health. He continued this work at the School of Public Health at the University of Pittsburgh and found arthritis to be generally a mild disease that can become crippling under certain psychological and sociological circumstances. He became increasingly interested in how psychological trauma affects all facets of a man's health. In 1961 Cobb came to the Institute for Social Research at the U-M to join a research team that was studying the influence of the organizational environment on the health of employees. Here he did the work on which the book *Termination* was based (see review on page 8). In this interview he talks about some of the other work he has done on jobs and health.

Dividend: Can you describe some of the projects related to jobs and health currently being worked on at the Institute for Social Research?

Dr. Cobb: Our program, or group of projects, is now called "Social Environment and Mental Health." The work includes studies on psychological and social factors in the genesis of coronary heart disease being done by John R. P. French, Jr., professor of psychology. We are also doing three studies centering on the work-no work boundary. One, "Termination in Middle Life," is the study Al Slote's book describes, and focuses on the effects of job loss on workers. Another, done by Robert Kahn, now Director of the Survey Research Center, and Jerald Bachman, is called "Youth in Transition," and focuses on what happens to youngsters as they leave school and go to work. The third, by Stanley Seashore, professor of psychology, and Willard Rodgers, focuses on retirement. We are also finishing a survey of working conditions and how they contribute to job satisfactions, as well as doing methodological studies on the measurement of mental health.

Dividend: Can you tell us a little about the study you did comparing

The Man in the Middle

frequency of peptic ulcer among executives, craftsmen and foremen?

Dr. Cobb: We found that foremen had a greater frequency and severity of peptic ulcer than either craftsmen or executives.

Dividend: How do you explain this? Aren't executives supposed to be the most ulcer-prone people?

Dr. Cobb: They are supposed to be, but our research does not back this up. Rather, it seems to indicate that it's the man in the middle who gets the ulcer—perhaps because he has the most unmet needs for social support.

Dividend: When you say "man in the middle," do you mean the foreman?

Dr. Cobb: Not only the foreman, although certainly he is one of them. Are you aware that employees frequently turn down a promotion to foreman—that it's sometimes hard to find a person who will take the job of foreman?

Dividend: Why is that?

Dr. Cobb: I think perhaps it's because a man who is foreman no longer has a secure job. He is no longer affiliated with the union, but he is really not in the ranks of management either. His friends may look on him as a bastard because he has to do a job for management—and management may not pay much attention to his recommendations because he's low on the totem pole. It's a job full of strain, and he gets an ulcer.

Dividend: What characterizes these "people in the middle?"

Dr. Cobb: Our research indicates that people who work at any "interface" show more physiological evidence of strain than people who are fully within one element or another. For example, the external salesman would be a "man in the middle"—between

the company and the public. People working with two or more divisions within a company show more strain than people who just work within one division. The "man in the middle" does not have people on either side strongly supporting him. Instead, he has pressure from *both* sides. The executive is bolstered by a buffer zone of people under him. The worker is supported by his union. But the foreman has neither of these forms of support. And it's this unmet need for social support that seems to contribute to ulcers.

Dividend: You have found a relationship between the incidence of gout and stress. Could you tell us a little about that?

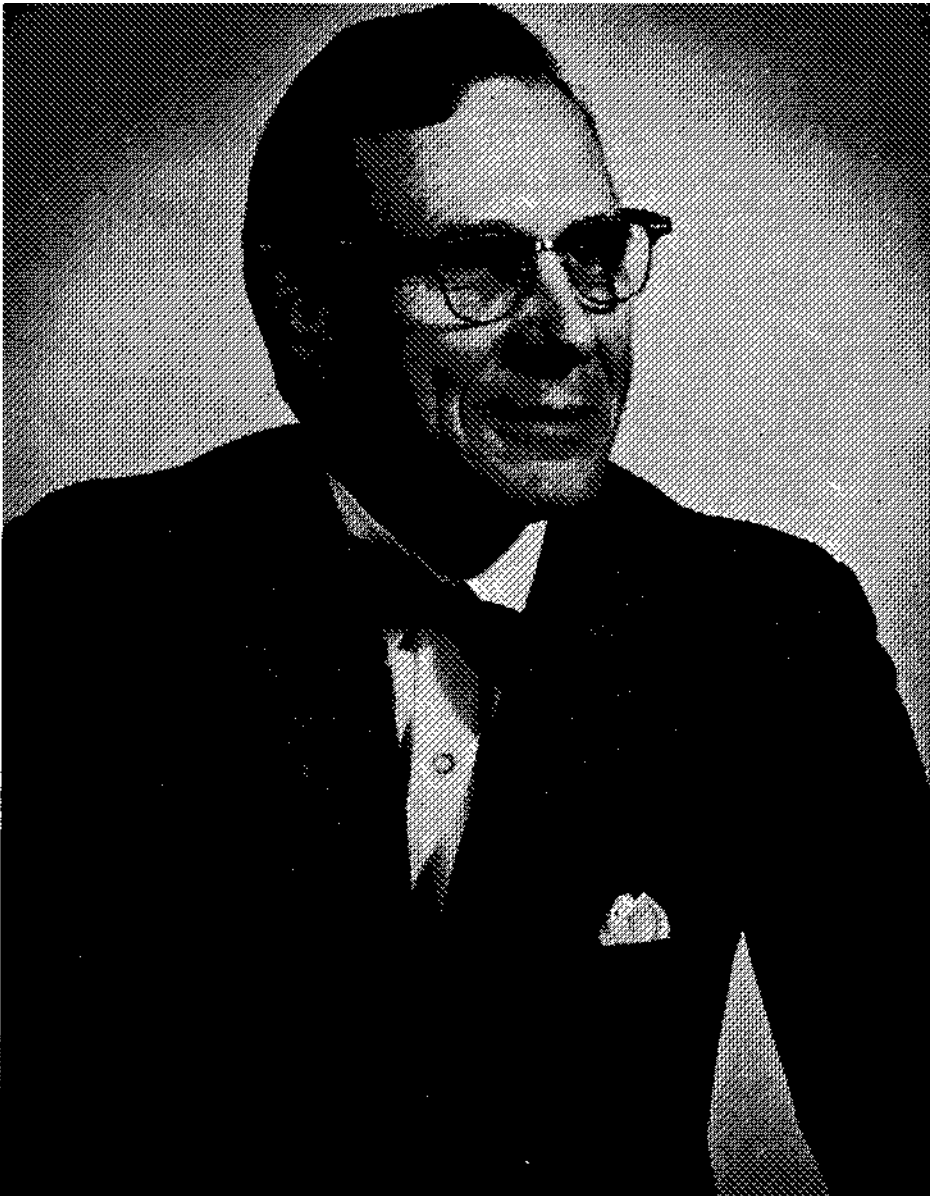
Dr. Cobb: We found in the Termination study that people whose jobs were about to be abolished had substantially higher levels of uric acid than our control group. However, the uric levels returned to normal after the people became established in new jobs. Uric acid is an indicator of gout. There is evidence to support the statement that executives have high uric acid levels—that uric acid is in some way associated with drive and achievement orientation.

Dividend: What conclusions do you draw from this?

Dr. Cobb: Uric acid levels seem to go up in people who are placed under environmental stress or who seek out stressful situations. Uric acid is chemically very similar to caffeine—it stimulates the individual in somewhat the same way. We wonder if it is not an adaptive mechanism—that is, when the environment is stressful the uric acid level goes up, and perhaps helps the individual to meet stress in some physiological way not yet understood.

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i4n Interview with *Sidney Cobb, M.D.*
Program Director, *Institute for Social Research*



Dr. Sidney Cobb

Dividend: What about job status and health?

Dr. Cobb: It's been shown that those high up in civil service lose much fewer days because of illness than those lower on the scale. Some of this may be explained by saying that as you go higher up, there are easier ways to take time off than by calling in sick. But the difference in the rates is so large as to indicate that more is involved than this.

Dividend: Does research show that self-esteem is related to illness?

Dr. Cobb: One study by Dr. Stanislaw V. Kasl, now at Yale, showed that people who were promoted had less illness than they had the year before (as measured by visits to the company dispensary—admittedly not the best of all measures). Conversely, those people who were demoted had more illness (as measured the same way) than they had the year before. There is some evidence to indicate that life change of any kind will increase the possibility of illness.

Dividend: Can you tell me other ways in which a man's job and his health are related?

Dr. Cobb: I would not say the job and health are related so much as I would say that the *fit* between a man and his job is what affects his health. We have some evidence that people have characteristic rates of work, and that people who are working within their optimum range are healthier than those who are either underloaded or overloaded. But of course overload has a good many dimensions.

Dividend: What do you mean?

Dr. Cobb: In one kind of overload, for example, the person has simply too much work to do—in other words, quantitative overload. But a qualitative overload exists if the person is being asked to do a job for which he is really not qualified.

Dividend: How did you measure quantitative overload?

Dr. Cobb: One way was to ask secretaries to keep records for one week on various factors—for instance, how many phone calls the boss initiated, how many committee meetings he went to, how many people came in to see him without an

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What Will the Next 10 Years Be Like?

by **George H. Brown**
Director, Bureau of the Census

What will the next ten years be like? There is much to tell about where this country has been—particularly in the last decade—and where it is going in the next. That's my job as director of the Bureau of the Census: to report where we have been since 1960 and offer some insights on where we might be in 1980.

Using Census Bureau projections and bearing in mind that conditions can change, it seems likely that the number of births in the next decade should rise to between four and five million per year. The rate of increase for our total population may well be between 1.1 and 1.4 percent per year, assuming that current levels of fertility continue unchanged. This means that the U. S. population in 1980 will be between 225 and 235 million, an increase of 20 to 30 million people above the present level.

President Nixon has shown great interest in the need for a farsighted national growth policy. He has created the national "Commission on Population Growth and the American Future," headed by John D. Rockefeller III, and I am sure you are going to hear much about the Commission's work in the months ahead.

One of the matters that will concern the Commission is population distribution. In the decade 1960 to 1970, when the national growth was about 13 percent, that of metropolitan areas was about 15 percent. This is a major change from the period between 1950 and 1960. In those years, the Nation grew about 19 percent, but the metropolitan areas grew by 27 percent. Metropolitan growth is still somewhat ahead of the rest of the country but the differential is rapidly being narrowed. If the trend of the most recent decade continues, the proportion of people

living in metropolitan areas would increase only slightly between 1970 and 1980.

The slowdown in the growth of metropolitan areas has not stopped the shift to the suburbs. In 1960, fewer people lived in the suburbs than in the central cities. Today, more than half the people in metropolitan areas live outside the central cities and all indications are that the trend will continue.

The black population is now more heavily concentrated in the central cities than the white population. About three-fourths of the black population growth since 1960 has occurred in central cities of metropolitan areas, most of it through natural increase rather than immigration. Central cities gained three-quarters of a million between 1960 and 1969, but this net change was the result of an increase of 2.7 million in the black population and a decline of 2.1 million in the white population. If these trends continue into the future, black people will account for approximately 30 percent of the population of the inner-cities by 1980, compared with their approximate 20 percent today.

Ages and Households

Along with changes in places where people live, there will also be some dramatic changes in ages and households. The accent will be on young people. One-third of the expected total population increase in the next 10 years will be in the 25 to 34 year group. In all, we will have an additional 19 million people in their 20's and 30's, and early 40's. On the other hand, there will be very little increase in the number of people between 45 and 64. The remaining

6 million persons expected to be on the census rolls will be divided between pre-schoolers (about 5 million); and over 65 (about 4 million); for the elementary and high school age group combined, those aged 5 to 15, there will be about a three million *decrease*.

The most significant fact about the expected change in age composition is, as I have mentioned, the very sharp increase in the number of persons in their 20's and early 30's. The meaning is clear: The next 10 to 15 years is the era of the young married.

We would, therefore, anticipate a rapid rate of household formation. During the past few years there has been an average of nearly two million marriages per year, up from 1,000,000 in the early 1930's. Census experts believe this will continue for the next 15 years reaching a peak of about $2\frac{1}{2}$ million by 1985. It is likely that we will need about two million new dwelling units per year to accommodate new families and replace worn-out housing units. Any appreciable increase in housing standards or the tendency of youngsters to move out on their own at an early age will increase the demand for housing even more. Since we are heading into an era of newly weds, much of the demand, as we approach the close of this decade, will be for private homes rather than apartments. This doesn't mean, however, the end of the apartments-building tendency in many suburban communities—now or in 1980. Rising land costs inside many cities have virtually forced an increase in apartment house building in nearby suburbs. The building of one-family homes is moving to outer suburbs because of their rising cost of construction.

School Enrollments

We have already considered some of the major trends in age distribution—foreseeing, so to speak, the accent on the young adults. These trends will have an important impact in the next 15 years on school enrollments. The number of elementary school pupils will probably drop slightly in the next few years—return to its present level by 1980—and then rise somewhat by 1985. High school enrollment is expected to change relatively little in the next 15 years. However, the number of college students is expected to rise by more than 50 percent from its present level of 71½ million to about 111½ million in 1985. About half of the expected rise in college enrollment is due to population increase; an equal amount is due to the proportion of young people attending college. It is obvious that, if our society is to have the ability to handle the numbers of young people who expect to attend college, we not only need more facilities and faculties and college presidents, but farsighted vision and understanding on the part of the public if we are to plan adequately for the next 15 years.

There is still another way of looking at our coming age distribution:

- rapid growth among young adults between 20 and 34, and
- lack of growth in the 45 to 64 year age group.

Some say such an age ratio could mean the following: there may be a shortage of experienced older men for positions of leadership in government, industrial management and politics. There could be pressure on some older men to postpone retirement. It could mean less patience by younger men. In any event, by 1985 we may expect to see more young leaders in government, private industry and politics, than ever before.

The Work Ethic

In taking a look at the future, I think it worthwhile to recognize that there has been no basic change in the work ethic of the American people in the past 10 years. In fact, the number of people in the total labor force has increased faster than



George H. Brown, director of the Bureau of the Census, spoke to business school students at the Dean's Forum, a program under which Dean Floyd A. Bond brings distinguished speakers to the School from time to time. Dr. Brown, who holds an MBA from Harvard and a Ph.D. in economics from the University of Chicago, was Manager/Director of the Marketing Research Office of the Ford Motor Company before being named Director, Bureau of the Census, in September, 1969. His daughter, Ann, received her MBA from the University of Michigan Business School in 1958.

population increase—a 23 percent increase in the total labor force over the decade as compared to an 18 percent increase in the working-age population. An analysis of the data shows that all of the increase is due to a greater participation in the labor force by women. In 1960, 40.1 percent of all women aged 14-65 were in the labor force. In 1970 the percentage was 47.0. Over the same period, participation by men in the labor force declined from 86.1 percent in 1960 to 82.1 percent in 1970.

These days you hear a lot about Women's Lib. If Women's Lib means liberating women from the kitchen, it sure came on strong during the 1960's.

The other aspect of these statistics is that our youth are not a "cop-out generation." Here are the facts. In 1969, 39.3 percent of all 16- to 21-year-olds in high school or college also were in the labor force. (That means, in our terminology, at work, temporarily laid off or looking for work.) In 1959 the figure was 30.5 percent. Furthermore, 34.7 percent of the students in that age bracket actually *had* jobs in 1969, compared with only 20 percent 10 years before. A tremendous difference!

Of the 16 to 21-year-old part-time college students in 1969, 39.8 percent were in the labor force, a jump from the 32.9 percent in 1959. The figure for full-time college students in 1969 was 36.6 percent—up from 27 percent in 1959.

If anyone ever asks you "What ever happened to the old-fashioned student who worked his way through college?", you can quote me as saying "He's still here, and there are more of him than ever before."

Family Incomes

With the work ethic being as strong as it appears, perhaps it's time to talk about family incomes. Census experts calculate that American families will have far greater incomes in the near future than they have today. All we need to do is assume that the level of income will continue to rise at the same rate it has for the past decade and that the cumulative percent

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GOING TO LIVE?

By Karl Pearson
Professor of Business Administration

Housing, is without doubt, the biggest underdeveloped market in our country. We have been producing housing at less than sixty percent of our stated needs. In fact, we have been *losing* homes at a faster rate than we have been replacing them. And in the next ten years nine million more housing units will be demolished or made uninhabitable. Two million of our present housing units are over eighty years old.

At the same time that we are losing homes, the demand for homes is soaring. Even now there are two million marriages a year as against one and a half million just ten years ago, and the marriage rate will reach two million three hundred thousand by 1975. By the year 1975, the 25-34 age group—the one most likely to engage in household formation—will have increased by almost fifty percent. Where are they all going to live?

To meet the housing needs of the nation, twenty-six million new units, or an average of two million six hundred thousand per year, must be constructed in the next 10 years. Last year we produced slightly over one half that amount.

The monthly housing expense on a new medium priced home is \$290.00, requiring a yearly income of \$14,000

to sustain, and only one family in five makes that much money. What can we do to provide for the mammoth market for low and moderate income housing?

What is Industrialized Housing?

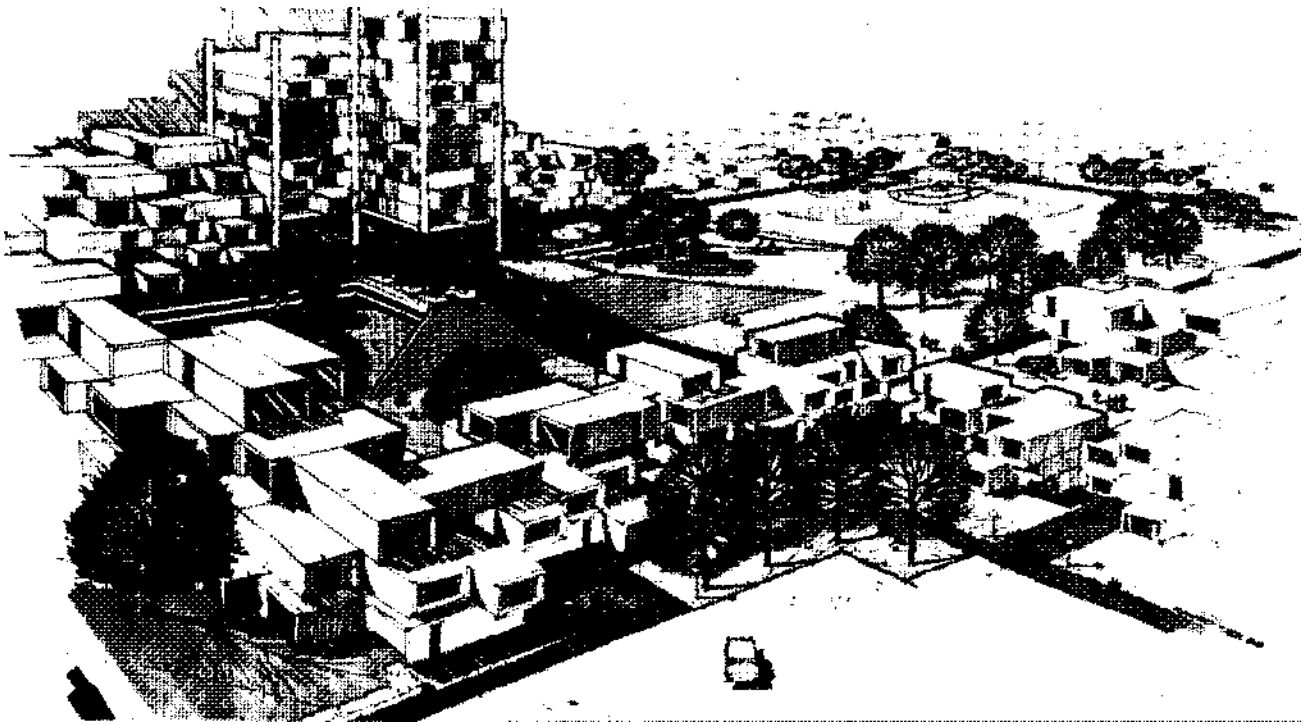
The housing demands in the decade ahead will increasingly be met by industrialized housing. This is a term loosely applied to pre-fabricated housing, pre-cut housing, housing components, sectionals, modulars, and sometimes even to mobile homes. There is now a tendency to confine this term to modulars. A module is a three-dimensional unit, finished at the

About the Author: Karl G. Pearson, professor of business administration, has written extensively on the subject of real estate. He was selected by the National Association of Real Estate Boards to write the 32 course syllabi for the designation, Graduate, Realtors Institute and is a member of the Study Commission of Michigan's Licensing Laws in Real Estate and of the Detroit Real Estate Board. He is currently preparing a monograph on industrialized housing for the Institute of Science and Technology at The University of Michigan.

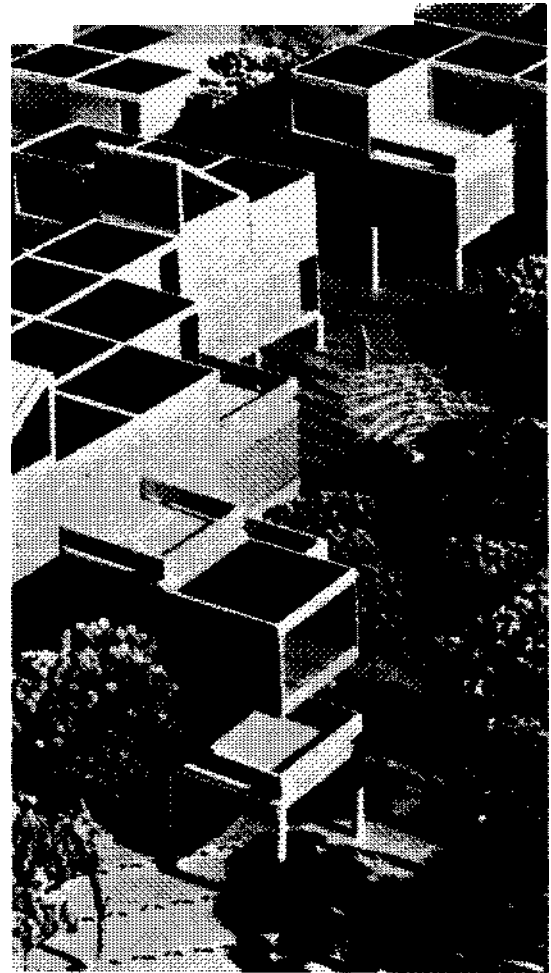
factory, and bolted together at the site. Individual modules are transported over the road by truck, and leave the factory fully finished inside and out, including wiring, plumbing, major appliances, and furniture. At the site, modules are placed by crane on a previously prepared foundation, joined together, and connected to utilities. It is possible in the course of one day to drop such a factory-built home in place. Modules can be stacked, one on top the other, or placed side by side. The manufacturer may do the site preparation, connect the wiring and the plumbing, dig the basement, and put in the landscaping.

Machinery, Not Men

Industrialized housing permits machinery to be substituted for expensive, on-site labor. Complex jobs in the factory can be broken up and divided among semi-skilled workers, a substantial percentage of whom can be women. Women are presently doing cabinet piecework assembly, producing roof trusses, building countertops, and doing detailed finishing work. The repetitive operations of industrialized housing, in fact, provide for a more efficient use of labor. Skilled operations can be standardized, thus making it



Abo, e.a 1-foot wide factory produced system using three basic modules: the lining module, the utility (core module) and the bedroom module. The modules can be stacked to a height of six floors, although the high rise building will use a separate structural system for support. Light, plywood panels are held together by a polymer bond that makes the panel to act as a single structural unit in resisting loads. A single panel unit (contains the framing material, sheathing, and interior finishing materials. Rooms may be made of various sizes by combining and dividing modules and using "room extenders" (a half-sized module). The system is based on pre-constructed building blocks modularized in a checkerboard pattern (that provides spaces between the modules each approximately as large as a full module, these spaces, when enclosed on the outside, provide habitable areas, thus reducing costs by eliminating duplication of walls and slabs as in other systems. The modules are completely finished and can be lifted directly into final position.



possible for less skilled labor to complete them, and bringing new people into an industry that has been losing its labor supply.

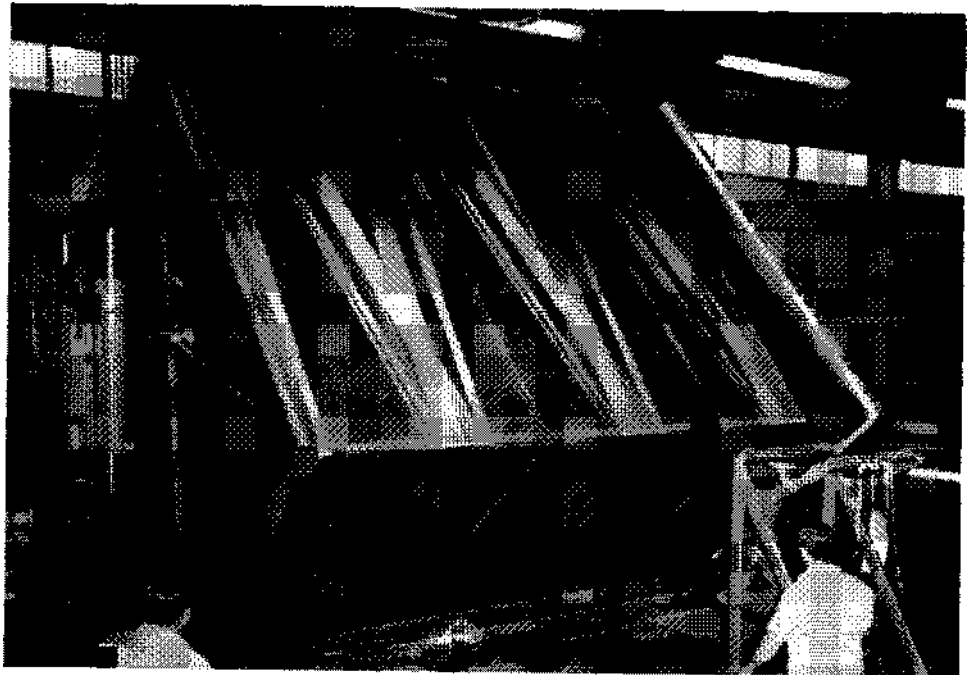
Centralized production control, quality controls and weather free production in and out of season will be bound to reduce construction time and costs. Reduced construction time will shorten construction loans, with resulting reduction in interest charges. Because industrialized housing is built in a factory where machinery can be installed, it can make for assembly line techniques and for volume production.

Metals and plastics can be used to a far greater extent with industrialized housing, for they can be worked and shaped inside the factory with heavy equipment that cannot easily be brought to on-site construction. Steel and aluminum are being used even now for framing and floor joists, and plastics are being used for structural components. Metals have low maintenance characteristics and high strength-to-weight ratios, and they are adaptable to mechanization.

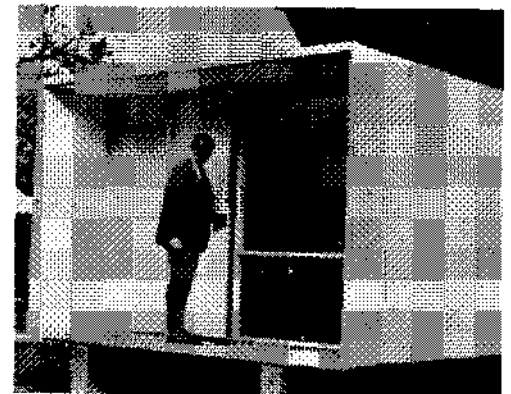
So far the largest production of modules is for single-family homes. But there is also production for multi-family units, for vacation homes, for town houses, and for non-residential structures, such as stores and office buildings. Most manufacturers still use wood as the basic structural material, but in a growing number of instances, wood-metal combinations are employed. As yet, a relatively small percentage concentrates on metal as the basic material.

What About Building Codes?

Local building codes, varying one from another, and based on material standards, rather than performance standards, are posing barriers against the erection of industrialized housing. The hope is that more and more states will follow the example of California, which now permits factory-built structures, produced in state-inspected plants, to be erected anywhere in the state, regardless of local building codes to the contrary. Nine other states have followed California's lead in this regard. With the shield of over-riding codes,



Abort-, a filament-wound fiberglass room module on a huge mandrel, the basic forming jig for this type of construction. Right, a man stands at the entrance to one of the first filament-wound fiberglass rooms in the U.S. The room is located across the street from the U-M Business School, just outside the Architectural Research Lab. Below right, an artist's concept of a one story dwelling made from fiberglass modules.



manufacturers can standardize the production of a limited number of models, without concern for the variations otherwise required at the local level. Even in California, however, some local opposition still exists, and one municipality, despite the over-riding state law, has declared a moratorium on the erection of industrialized housing. At the national level, Department of Housing and Urban Development Secretary George Romney has implied that pressure might be brought against local code barriers either through a possible federal code or through the withholding of federal housing aid from localities that interpose such roadblocks.

Financing and Marketing

As with so many new techniques, institutional lenders tend to adopt a wait and see stance before providing the large amount of financing required for plant and equipment. Capital needs are much higher than initially realized. Casting a shadow is the memory of the failure of Lustron and other pre-fab manufacturers back in the 1950's. Lenders also look with a jaundiced eye and an air of disenchantment on the many small emerging modular firms. So many seem to have gone into this field with little more than a hope and a prayer.

But there is a bright side to the financing picture. This consists in the mergers and joint ventures of module manufacturers with well financed corporations seeking expansion in industrialized housing, in many instances as captive markets for

their products and showcases for their wares. Some major industrial corporations have been able to get construction loans for their real estate subsidiaries at prime interest rates plus a modest compensating balance. They also have the financial resources and the staying power to see the industrialized housing projects through for the long term. There are also three-way joint ventures of builder or land owner, an institutional investor like a life insurance company, and a building product manufacturer. Other financing sources are government sponsored modular projects, real estate investment trusts, and limited partnership participations. There is a major financial advantage in the shortened period for which construction loans are required, and the consequent reduction in interest charges. The speed-up in the use of working capital and the reduction in financing costs in the carrying of inventories, as well as the greater ability to gear production to sales—all these factors lessen the financing burden.

From the Factory to the Site

On the other hand, there are serious marketing problems to be surmounted. Modules are transported from factory to on-site destinations on flat-bed trucks, operable only during daylight

hours. This not only imposes transportation charges; it also calls for packaging techniques to avoid the risk of damage in transit. It likewise limits the geographical marketing radius a particular manufacturer can serve. This means numbers of smaller plants must be set up at strategic marketing locations, rather than large factories, enjoying the economies of scale and centralized operations. The width limitations for highway transportation correspondingly limit the permissible width of individual modules, and thereby restrict the flexibility and variety in design, regarded as so essential to ward off the stigma of standardization.

Furthermore, industrialized housing has not yet developed a consensus on what are the most efficient and economical marketing channels. Sales are made directly to consumers, such as localities engaged in housing projects; to builder-developers; through real estate brokers; and to dealer-erectors. Some larger industrialized housing manufacturers are integrating the production and the marketing functions.

Consumer Acceptance?

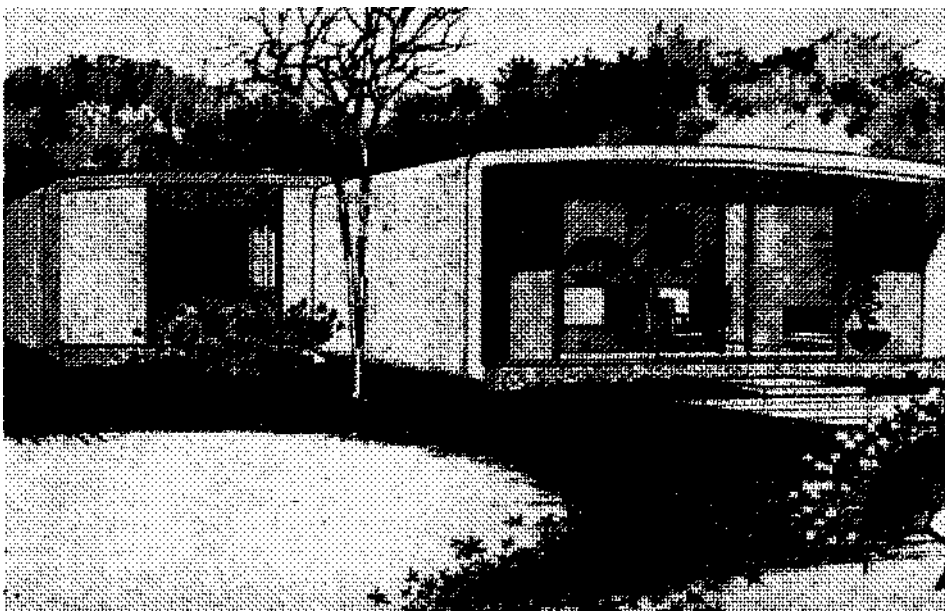
But the major marketing problem is the lack of consumer acceptance. Most potential consumers do not

know what industrialized housing is. They confuse it with mobile homes. The varieties of nomenclature make for sins of semantics—pre-fabs, pre-cuts, panelized systems, sectionals, factory built, prototypes, and modules—all serving to befuddle and bewilder. In the public mind, industrialized housing is equated only too often with cheap housing. It is associated with uniformity and standardization—"hen coop estates" with nothing for the rooster to crow about. Some regard it as just another name for public housing. Admittedly, some industrialized housing does indeed look cheap and shoddy, and, unfortunately, transfers this image to the entire concept.

A tremendous job of consumer education and understanding of industrialized housing remains to be done. Most of the expositions, conferences, and conventions on industrialized housing so far have consisted of producers trying to sell each other on the merits of individual products. Promotional advertising and educational articles on the subject have to date largely been confined to trade journals. There is a great need for the kind of conference started at the University of Michigan in April, 1970 and sponsored by the Institute of Science and Technology. The conference concentrated on the A, B, C's of industrialized housing, and was attended by builders, realtors, and manufacturers, as well as the general public. A similar conference was held this spring. A full public relations consumer education program cannot, however, materialize from the diverse and fragmented industrialized housing sector presently existing. It can come about only when the industry finds itself and reaches full strength through consolidations, mergers, acquisitions, and integration, and is then in a position to promote the product from a position of power and authority.

What of the Future?

The question is frequently asked: Will industrialized housing throw construction union members out of jobs? The answer is: "No." There is



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Where Will They Live?

continued from page 17

a serious shortage of manpower in construction unions. A major contribution of industrialized housing will be the additional labor force it will bring into being. Construction union workers will be needed for the large percentage of conventional structures that will continue to be built entirely on-site, and, likewise, for on-site erection of modulars. Nor will local builders and contractors be thrown out of employment. They will be needed to market industrialized housing, to acquire the land on which it may reside, to arrange for financing, and to get zoning and building code clearance.

To what extent will industrialized housing reduce the cost of present day structures? Very little, if at all. It is more likely to bring about a leveling of existing prices than a major drop. Industrialized housing will tend to make for a price plateau, instead of the ever-rising spiral to which we have been subjected. After all, labor is not the only item of construction costs. There is also the cost of materials, interest, administration, and overhead, together with the cost of the land on which the structure is to reside. Over and above these costs is that of transporting modulars to on-site destinations on flat-bed trucks, operable only during daylight hours.

The future of industrialized housing knows no bounds. As the only way to beat high costs of construction, its acceptance is inevitable. Being so ideal for fast assembly in high-density areas, it will enjoy an outstanding growth in townhouse developments, where a standardized appearance is a relatively minor drawback. Its techniques are likewise peculiarly adaptable to urban renewal improvements. Plumbing, heating, and wiring sub-systems will increasingly be developed to fit into the modular form of plant production. Automation, at long last, will hold the reins in homebuilding. The construction unions are taking an official position that there is no opposition on their

part to material innovations, new sizes of equipment, new methods of installation, and new tools. They seem to realize that the time is ripe for a revolution in building techniques, and that they must accept the change entailed.

The studies of the Department of Housing and Urban Development lead it to conclude that by 1980 two-thirds of all new housing—whether pre-fabs, pre-cuts, components, sectional, or modular—will be factory produced. Certainly, the keys for success in reaching our housing goals are mass production, mass distribution, and mass erection. Certainly, these will be realized only by an acceptance of industrialized housing, and a departure from handicraft methods, some of which date back to Biblical times and result only in high unit costs and low volume output.

The Next 10 Years

continued from page 13

distribution of families and of income will be constant for each age group.

Based on these assumptions, real incomes would grow about 100 percent during the next 15 years. In 1968, family money income totaled \$500 billion. By 1985, it is expected to exceed \$1 trillion in 1968 dollars. Average family income is expected to rise from \$8,600 today to \$15,000 in 1985, measured in dollars of constant purchasing power. At present, about one-third of total income is received by families with income over \$15,000. By 1985, families at this income level will receive nearly three-fourths of the income. Moreover, because of the combined impact of both income and population growth, the number of dollars in-constant-purchasing-power at this upper income level will be about five times as great as it is today.

In a few words, we are heading into a society of an affluent majority.

We would do well to begin a new search—not for more quantity in life, but for balanced and purposeful growth.

What Happens to Workers?

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closing. For an uninsured man who is out of a job besides, the effect can be catastrophic.

Finally, Cobb supports the principle of the portable pension, so that older workers do not lose their retirement benefits along with their jobs. A prime example of this was Otto Mueller, who had worked at the Baker plant for 33¹/₂ years, and was 59 years and 9 months old when it closed. He was three months short of being eligible for a retirement pension, and lost all of his pension rights.

"Change," says Cobb, "is necessary for progress. And it is imperative that we do not adopt laws and regulations which would seriously inhibit change and progress. However, for a man displaced by automation there is no progress. Instead there's often pain, humiliation and despair. A plant closing is a genuine social emergency and it will be one measure of this country's greatness how well we respond to a phenomenon that will be increasingly common in the years to come."

Mr. Slote has given us much food for thought in *Termination: The Closing at Baker Plant*. This book should stimulate managements, union officials and governmental agencies to reexamine their responsibilities and actions toward this social emergency. There must be positive responses and plans made for the displaced worker to find suitable employment in another organization.

We cannot deny that technological changes and plant closings create social problems for those employees eliminated from their jobs. We can no longer blindly pursue the goal of improved operational efficiency without reckoning with the ensuing human costs. Slote points to some of the elements to be considered as we proceed down the road of progress. This is an excellent work and in this reviewer's estimation, is in the tradition of Upton Sinclair's *The Jungle*.

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John Johnson - Chairman

George King - Treasurer

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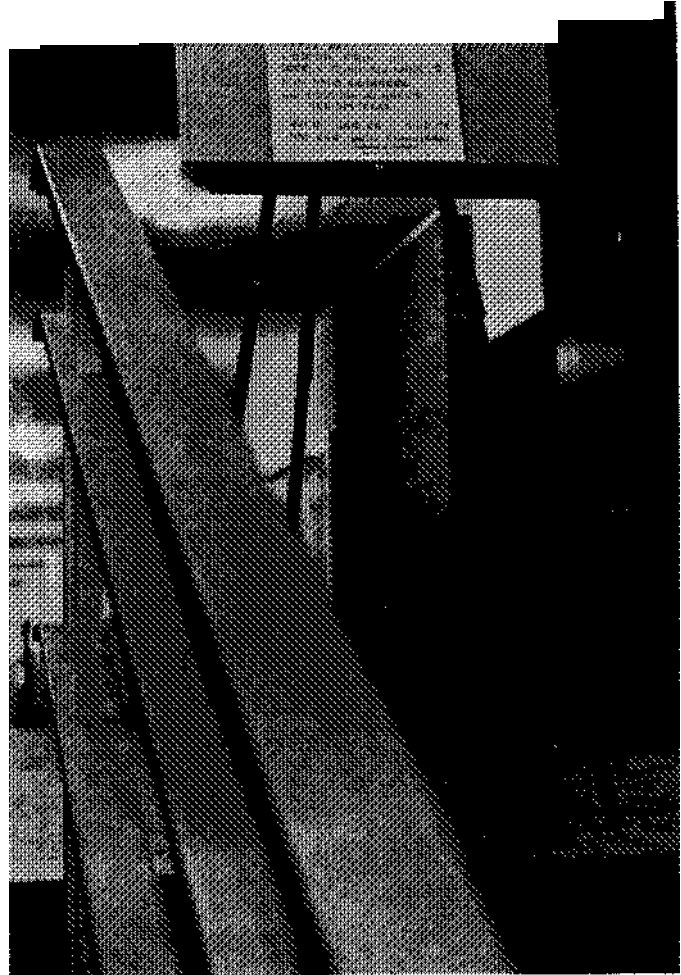
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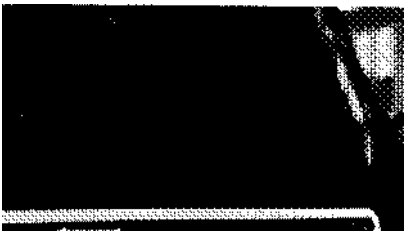
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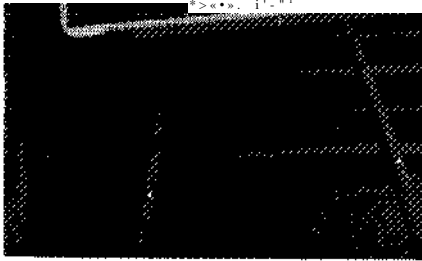
MONDAY BUSINESS MOVIES

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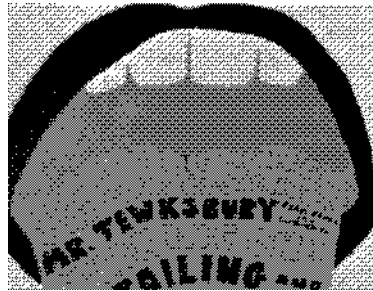
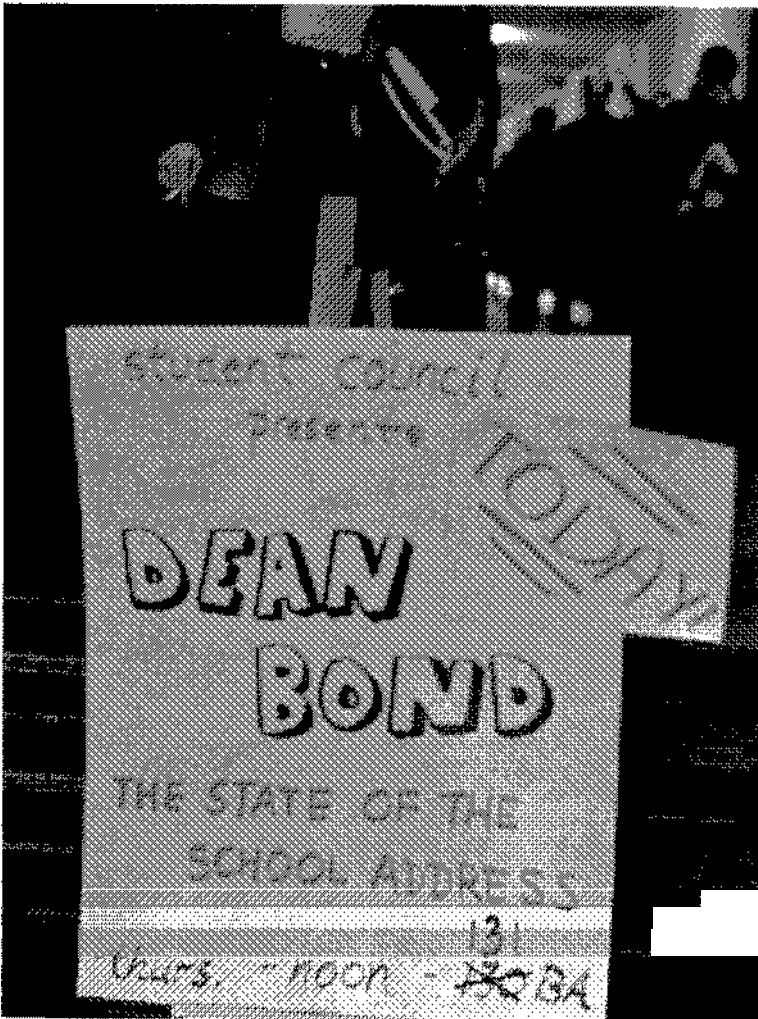
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Among Ourselves

An informal collection of items, including news of the faculty, of alumni, and of the school, and assorted other information, opinion or comment that we think will interest you.

Fourteen Firms Join Newly Created Associates Program

Fourteen firms have become members of the University of Michigan Graduate School of Business Administration's Associates Program now being launched, it was announced by Dean Floyd A. Bond, originator of the Program.

The firms are: American Electric Power Service Corporation, Clark Equipment Company, Ex-Cell-O Corporation, First National City Bank, General Motors Corporation, The Upjohn Company, Associates Corporation of North America, the Bendix Corporation, Detroit Bank and Trust Company, S. S. Kresge Company, Jacobson's, Inc., I.B.M., Libbey-Owens-Ford Company, and Manufacturers National Bank.

According to Dean Bond, activities of the Associates Program will be designed to promote the mutual interests of the Business School and the business community; to develop friendships, understanding and closer working relations between faculty and executives; to enrich the School's instruction and research and enhance its continuing management education programs.

The School plans to hold annual conferences and special programs designed especially for members of the Associates Program. These will include The Associates Forum and

The Associates Seminars. In addition, Associates will receive all research reports and publications of the School, an annual roster of MBA degree candidates, an opportunity to interview prospective graduates, and notice of timely meetings and seminars on subjects of interest to them.

William Moran, Ph.D. '67 Appointed Chancellor of the U-M's Flint College

William Moran, who received his Ph.D. from the U-M Business School in 1967, has been named to the newly-created position of Chancellor of the University of Michigan's Flint College. The appointment will take effect July 1st.

Moran, whose dissertation for a Ph.D. degree in Business Administration at Michigan was on intra-organization control and communication with specific focus on the university as an organization, is currently assistant executive vice-president at the State University of New York (SUNY) at Stony Brook. While getting his Ph.D. here, he worked as an assistant to Dean Floyd A. Bond. He also has had experience advising large corporations in management appraisal, corporate policy and planning studies.

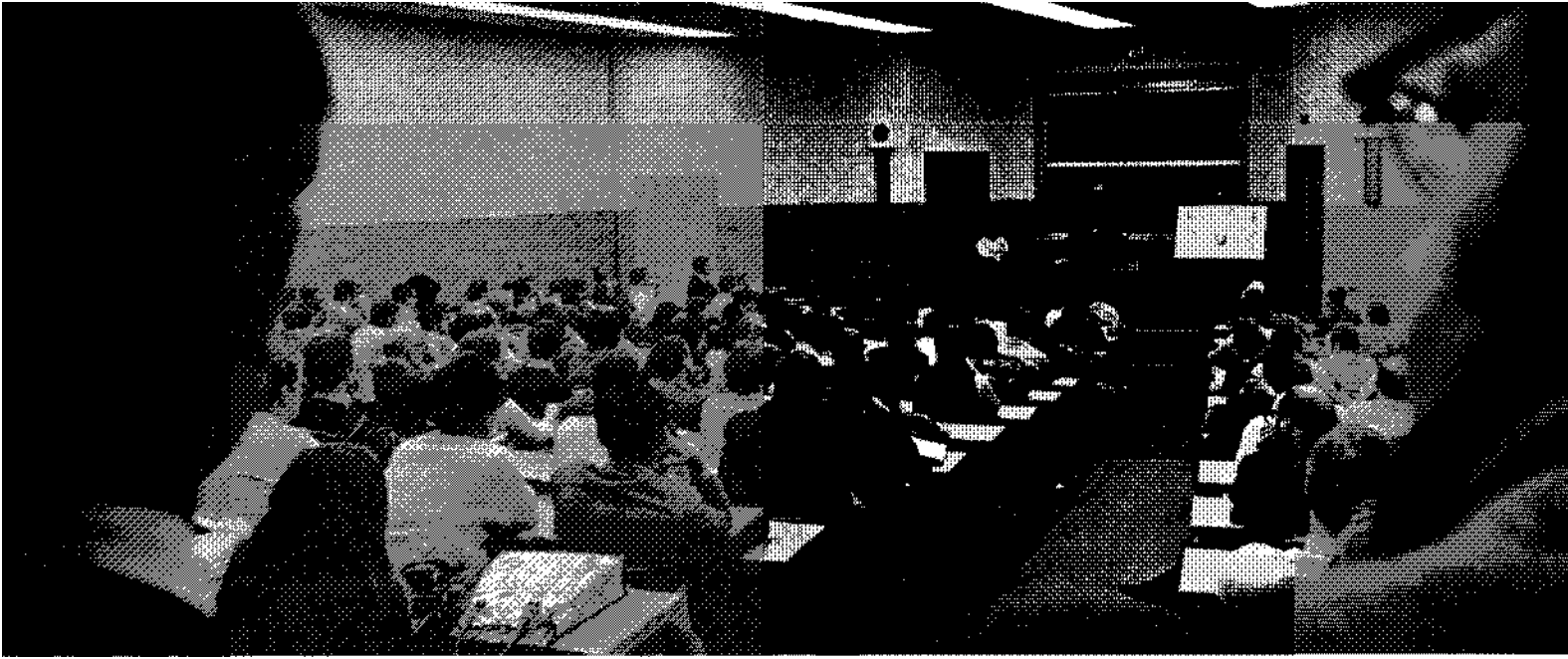
Before becoming assistant executive vice-president at Stony Brook, Moran served as assistant to the Stony Brook president, acting director of the budget, and director of long range planning. Announcing the appointment, President Robben Fleming said, "Dr. Moran's background in educational planning, and his rapid increase in responsibilities at Stony Brook, are excellent qualifications for his coming leadership at Flint College. As Flint College grows, Dr. Moran's skills will be most valuable."

While a doctoral student at the Business School, Moran was awarded a General University Scholarship, a United States Steel Fellowship, and a Carnegie grant as a Michigan Fellow in College Administration.

Arthur Andersen & Co. Supports Paton Accounting Center

Ninety-three University of Michigan alumni in the national public accounting firm of Arthur Andersen & Co. and the Arthur Andersen Foundation have contributed approximately \$101,000 to the William A. Paton Center for Accounting Education and Research.

Solicitations of alumni in the firm were initiated by the late Richard S. Claire, MBA '32, and were completed by Robert F. Klumpp, BBA '49.



A standing-room-only crowd of students gathered to hear Dean Floyd. A. Bond speak on "The State of the School"—the first lecture in the Sandwich Seminar program sponsored by the Student Council. Dean Bond listed the priorities of the School with learning and teaching first. He discussed excellence in education, emphasizing the need for a distinguished faculty, a select student body, and a favorable environment for learning and teaching. He explained the Dean's role in seeking these prerequisites of quality, and presented the architect's drawings for the new Assembly Hall building. Student questions centered primarily on possibilities for minority enrollment and recruitment.

A Series of Informative, Interesting, Exciting, Provocative Lectures

The Student Council of the Business School is sponsoring a series of noon hour lectures on topics of all kinds. Entitled "Sandwich Seminars," the lectures are billed as a "series of informative, interesting, exciting, provocative, noon-hour lectures and discussions brought to you by your Student Council."

The "sandwich seminars" have included a lecture by U-M President Robben Fleming on "The Future of the University," a panel discussion on educational methods in the University and in the School of Business, a lecture on the social implications of information technology by Manfred Kochen, professor of psychiatry, and a lecture on politics, planning and the environment by Jonathan Bulkley, assistant professor of civil and water resources engineering and of water resources.

John Schroeder, BBA '68 Plays Golf with Palmer and Nicklaus

John Schroeder, BBA '68, was quoted in the Fall, 1969 *Dividend* as saying "I have yet to make any money" playing golf professionally. But in 1970, he won over \$32,000 in his first full season of professional golf! He also gained an exempt status after making the list of top 60 golfers on last season's point list.

Here's how Schroeder describes his career after he survived the tough PGA players school, where 100 aspiring youngsters competed for 15 places as approved players.

"My first tournament was the Texas Open," he says. "I shot 75-76 in the first two rounds and didn't make the cut. Things went downhill from there. I took about three months to get acclimated on the tour and I finally made the cut at the Minnesota Golf Classic and earned my first check—\$119."

That was in 1969. He made a few more checks, then in 1970 began to cash them on a steady basis. In April he headed for Dallas and the Byron

Nelson Classic, the tournament that was to be the high point of his career.

The first round was rained out and a final round of 36 holes was scheduled for Sunday, and for national television coverage. Schroeder shot 73-66 Friday and Saturday, then learned who his playing partners were to be Sunday—Jack Nicklaus and Arnold Palmer.

"I was excited," he says. "My wife was nervous. Everyone kept asking 'Aren't you worried about tomorrow?' Pretty soon I was. I took a sleeping pill and still couldn't sleep. But tomorrow came."

He shot a 69 in the morning round while Nicklaus and Palmer matched 68s. Then, in the afternoon, before millions of television fans, Schroeder shot a 67 while Palmer had a 69 and Nicklaus 71.

But Palmer and Nicklaus finished in a tie for first, Nicklaus winning in a playoff. Schroeder was one stroke back, picking up \$5,900 for third. But he gained a national reputation.



Asa Spaulding receives the Business Leadership Award from George Lilly, president, and Sue Jorgensen, vice-president, of Student Council,

Asa Spaulding Receives Business Leadership Award

At a ceremony March 19 in Rackham Amphitheater, Asa T. Spaulding, former president of North Carolina Mutual Life Insurance Co., received the 1971 Business Leadership Award of the Graduate School of Business Administration. The award is made annually to a prominent businessman who has shown "an understanding of the responsibility of business to society and an interest in business education." The recipient is chosen jointly by students and faculty members.

Spaulding received a gold medal and parchment scroll from George Lilly and Susan Jorgensen, president and vice president of the Student Council. He then delivered the 14th annual Business Leadership Award address, entitled, "Opening of Pandora's Box: A Management Dilemma."

Spaulding joined North Carolina Mutual, the nation's largest black life insurance firm, in 1924. He served as the company's actuary from 1933 to 1958, while concurrently serving as assistant secretary from 1935-1948 and vice president and controller from 1948-1958. He was president of North Carolina Mutual from 1959 until his retirement in 1968, has been a director

of the company since 1938, and is also a director of numerous other business enterprises including W. T. Grant Co.

In 1956 Spaulding was a member of the U.S. delegation to the UNESCO General Conference in New Delhi, India, by appointment of President Eisenhower. He serves on several federal and state government commissions and is a director, officer, or member of many professional, philanthropic, and youth organizations. In 1968 he became the first black man to be elected to the five-member Board of County Commissioners for Durham County, N. C.

Spaulding is a trustee of Shaw and Howard universities, the National Conference of Christians and Jews, the People-to-People Program, and is a former trustee of the National Urban League.

The recipient of a B.S. degree from New York University in 1930 and an M.A. degree from the U-M in 1932, Spaulding has received honorary degrees from Shaw and Duke universities, North Carolina and Morgan State colleges, and the University of North Carolina. He was awarded a Sesquicentennial Award by the U-M in 1967.

Students to Research World Trade Needs for Small American Companies

A new program designed to increase export sales by small American companies while at the same time training students in international commerce, has been launched by the U.S. Department of Commerce in cooperation with 21 participating universities. The Michigan Business School's participation in the program is under the direction of Professor Robert W. Adams and Associate Professor Vern Terpstra, both of the Program in International Business. Graduate students in international business will work on the project.

According to Commerce Secretary Maurice H. Stans, the program has been developed primarily to help small U.S. businesses that feel they lack personnel, know-how or resources to become exporters.

Here is how the U-M Business School-Commerce Department cooperative program will work to provide foreign market studies for U.S. companies:

— Commerce and the University will invite U.S. firms to take part and will compile a list of firms in this part of the Midwest that are interested. The University then will assign a graduate student majoring in International Business to work with each company selected.

— In cooperation with company officials, the student will examine the firm's capacity to begin or expand export operations. The student then will research international business data gathered by the Commerce Department indicating foreign sales opportunities for the firm's product, and will prepare a formal report with recommendations for action by the firm.

The study will include such information as the estimated size of a foreign market, rate of growth, expected gross margin on sales, extent of foreign and U.S. competition, possible product modifications and recommended means of entering the

market. Names and addresses of potential foreign customers and agents will be included.

U-M students will be assisted in their efforts by the Detroit Field Office of the Department of Commerce.

Other Midwestern universities also participating in the program include Indiana University, Northern Illinois, Northwestern, and Wisconsin.

IBM Again Fund\$ Computer Workshops

A two week program entitled "Business Faculty Summer Program in Computing" will be held in Ann Arbor June 21-July 2. This is the fourth in a series of computer workshops initiated by Dean Floyd A. Bond, Associate Professor Thomas J. Schriber and Professor W. Allen Spivey. The program is being held with the financial support of IBM and enjoys the sponsorship of the American Association of Collegiate Schools of Business. Three similar workshops were held at the U-M Graduate School of Business Administration in previous years—one in 1969 and two in 1970. This year, a second 1971 workshop will be offered in Boulder, Colorado from July 19 to July 30.

The Ann Arbor workshop will be directed by Dr. Thomas J. Schriber, associate professor of statistics and management science who originated the program. The Colorado workshop will be directed by Dr. J. Daniel Couger, business school faculty member at the University of Colorado's Colorado Springs branch. Each of the two programs will accommodate twenty-five participants from business schools across the country: both are filled.

Participants in the 1969 workshop prepared 21 fully documented computer cases which have been published in a 225 page book entitled *FOR TRAN Applications in Business Administration*. The book, co-edited by Dr. Schriber and Laurence A. Madeo, lecturer in statistics and management science, is available from Ulrich's Bookstore, Ann Arbor, at a

cost of \$4.50 postpaid. A similar volume is being prepared from cases developed by 1970 program participants, and it is expected that a third volume will result from the 1971 program.

Participants in the computer workshops learn the fundamentals of program development and implementation, study documented applications, and reach a level of confidence vis-a-vis "computers" and "software packages" so that use of the computer as an integral part of classroom teaching can be aggressively pursued, and effective direction can be given to student assistants who are working with the computer. A total of 18 Michigan business school faculty have been program participants to date.

Faculty News

Walter G. Kell, professor of accounting, is a consulting editor of the fifth edition of the Accountant's Handbook, published by the Ronald Press Company. He has also been appointed to the Committee on Auditing Procedure of the American Institute of Certified Public Accountants.

Douglas A. Hayes, professor of finance, has been elected chairman of the board of directors of the Security Bank and Trust Company of Southgate, Mich. This bank is located in the downriver communities outside Detroit and has 17 branches with assets in excess of \$300 million.

Dick A. Leabo, professor of statistics, has an article entitled "The Declining Marginal Propensity to Save" in the May issue of *Business Economics*, published by the National Association of Business Economists.

The revised edition of the book *Promotional Strategy* by *Martin R.*

Warshaw, professor of marketing, James F. Engel and Hugh G. Wales, was published in March by Richard D. Irwin, Inc. The first edition was adopted by over 100 schools in the U.S. and Canada.

Herbert F. Taggart, professor emeritus of accounting, has written a chapter entitled "Distribution Costs" for the *Handbook of Modern Accounting* published by McGraw Hill and edited by *Sidney Davidson*, MBA '41, Ph.D. '50.

Joseph W. Newman, professor of business administration, is the author of a new book, "Management Applications of Decision Theory,," published by Harper and Row, Inc. The book is written for the student of management who would like to find out more about what Bayesian decision theory is and what is involved in applying it. Based on Professor Newman's field research, the book focuses on applications, made both with and without the computer, to actual management problems of evaluating research strategies and alternative courses of action in product development and marketing.

Mary C. Bromage, associate professor of written communication, made a one hour video-tape on the subject of audit report writing for AID, Dept. of State, Washington. This tape will be shown around the world at various AID mission locations. She also conducted a seminar in functional communication for the staff of Manitoba Newstart, a Canadian federal government program. Her book, *Writing for Business*, is going into its second printing by the University of Michigan Press.

David L. Lewis, professor of business history, has written several articles on Henry Ford and the Model A. He has received a special citation from The Model A Ford Club of America "for outstanding service in the recording of Model A Ford Knowledge." He has also been notified that his biography will be included in the 1972-73 edition of *Who's Who in America*.

What is in The Money Pit at Oak Island?

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The Message

Wilhelm believed that the vault on Oak Island was designed to be used many times for temporary storage of treasure and that the carved stone gave some type of operating instruction on how to reach the vault without flooding. He was, therefore, looking for a message of this sort and indeed, that's what he found. The message, when decoded, reads "A ochenta gui(a) mij(o) r(i)a sumideq(o) F."

The letters in brackets above were omitted in the code, presumably for security purposes since "a" and "o" occur frequently as the endings in Spanish words. The last word has been misspelled and should be "sumidero" which means "drain" or "sewer tunnel." Thus the English translation of the coded message is: "At eighty guide maize or millet into the drain. F.-"

Here is the "combination" of the "safe." Maize poured into the drains would swell and fill the spaces between the stones, thus stopping the input of water from the sea. The

remaining water could then be bailed out of the shaft, making the pit more accessible. As the maize rotted, was loosened by tides, and eaten by small sea creatures, the drains would automatically reopen and water would again flow into the shaft to guard the vault. (Of course, no amount of maize could ever stop the flow of seawater now, as the area has been honey-combed with shafts, and the tunnel system completely destroyed.)

The signature "F" is represented in the code by the cipher symbol "II". Wilhelm believes this is a kind of "pun" and that the signature is in fact "F II" and stands for Philip the II of Spain (Felipe in Spanish) who ascended the throne in 1556, seven years before the publication of Porta's book. Philip was known to be interested in cryptology and it is likely that he was thoroughly familiar with Porta's book.

But Why?

But why would Philip have gone to so much trouble to have a continuous

treasure vault built in the Nova Scotia area? Here is Wilhelm's explanation.

After 1526, gold and silver shipped by the Spanish from the New World to Europe was moved only in guarded convoys and usually in the warm months. Ships loaded with treasure came from Mexico, Panama and Colombia to Havana, from which port they sailed in groups north to approximately 38° latitude and then turned eastward toward the Azores. If ships on this course were hit by a storm from the south (and the prevailing direction of hurricanes in this area of the ocean is from south to north), they would be blown toward Nova Scotia.

Suppose a treasure ship was damaged or blown off course in a storm. It would need to have a place to lay over for repairs, to wait out the winter, or simply to wait for another convoy. (Ships were never permitted to cross the Atlantic alone). Where would such a place be most conveniently located? Wilhelm's answer is Nova Scotia, the last possible stop on the mainland of North America before ships set out for the hazardous Atlantic crossing.

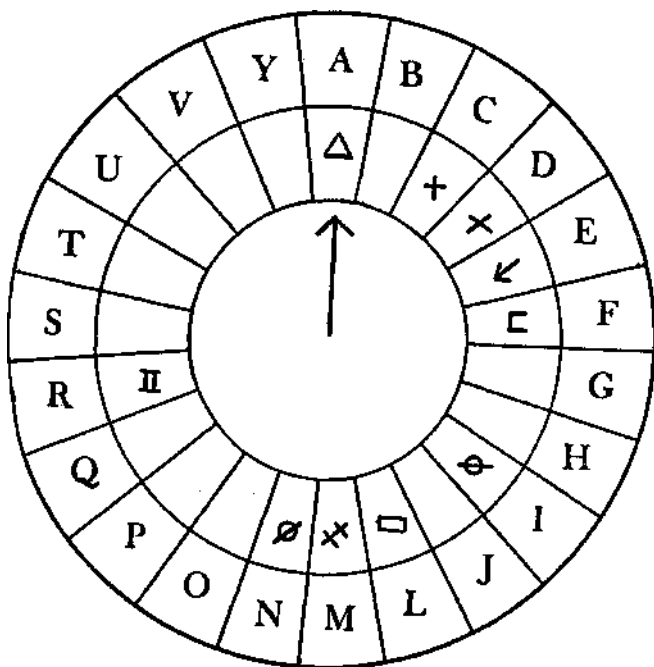
If ships did lay over in Nova Scotia, they would have needed a place to store their valuable cargo, since Spanish law prohibited keeping it on the ship. Regulations required that any ship in port place its treasure under the guard of the proper authorities. Wilhelm believes that the Oak Island vault was used to put treasure under government "seal" until damaged or off-course vessels could be repaired or otherwise made ready for the Atlantic crossing. It is known that the Spanish maintained a colony in Florida during this period to provide a haven for shipwrecked sailors. Why not a northern installation for the storage of treasure from ships temporarily disabled?

If this theory is correct, what is now in the "money pit"? During the reign of Philip II the Spanish crown was near bankruptcy and desperate for funds. If there were a treasure in the vault, would Philip have left it there, or "forgotten" it when he was in desperate need of money?

Or would he have drawn it all out, and reset the "combination" for possible re-use at some future date?

What do *you* think?

Reconstructed Oak Island cipher disk initial setting.
(Only symbols used in message are shown).



Links With Alumni

H. W. Hildebrandt

Director of Alumni Relations

Alumni, and alumnae, have a special role to play in indicating to colleagues that the overwhelming number of students on campus reject violence, that rational dialogue in the halls of academia is still dominant.

Our goals: to listen closely to alumni; to add their views into the process of change; to rekindle their interest in their school; and to ask for their financial support. These are the reasons for undertaking to revitalize and breathe new life into our Business School Alumni Organization.

We begin with a two-pronged approach: the Class Officer and the Regional Chairman.

We have asked, and will continue to ask about 75 persons to be representatives of their graduating classes. Each volunteer becomes a significant member of a group of people who may wish to help with reunion plans; maintain contact with the School about questions of concern; and head a once-a-year annual Business School Fund campaign. In short, the Class Officer may wish to speak for his class on matters of the moment, requesting the help of the Alumni Office in setting up programs, meetings, or other activities.

The Regional Chairman will be an alumnus in areas of the country where a cluster of alumni live, making possible the forming of a nucleus of interested business school alumni. You know our alumni span the earth. In fact 353 of our alumni live out of the country, while Cleveland for example has 129; Chicago 143, Detroit 1,070 and

New York 190. This means that the country will be divided into regions, headed by a Regional Chairman and Vice-Chairman, permitting more personal contact between alumni and the School.

What we have then are two sides of a coin. The Class Officers will maintain contact with their classmates through the mail, while the Regional Chairmen and their helpers will maintain contact through the personal approach.

In the meantime the Business School will continue to keep your address straight; send you the issues of the Michigan Business Review; send you the three yearly issues of the Dividend; send you plans for the yearly Detroit business conference; invite you to participate in leadership seminars; and send you copies of significant addresses given by business leaders at the School. We'll try to do our part.

We can't build an organization over night. Momentum on any enlarged project requires time. But when we realize that some of the leading business schools in the country have long and thorough programs for alumni, we here at Michigan intend to shake a leg.

We do need your support. The headlines concerning education may gain attention, but rarely do they tell of the insistent demands for excellence and reason that the faculty and administration have not abrogated.

A Class Officer and Regional Chairman approach will put us more in touch with alumni views. We welcome them.

The Man in the Middle Gets the Ulcer

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appointment, etc. We also asked the man himself to rate his degree of overload. We found a correlation between the man's own estimate of his work overload and the number of self-initiated phone calls he made per day. Remember, this estimate of overload covered a very specific and short time period.

Dividend: How did you find overload and health to be related?

Dr. Cobb: Robert Caplan is finding that those executives who measured high on the overload scale and who were also flexible people (as measured by psychological tests) also had elevated serum cortisol, high uric acid, high blood sugar and high cholesterol—higher than you would expect. These medical factors are evidence of physiological strain, which can be related to gout and heart disease.

Dividend: Why did you measure flexibility? What does that have to do with it?

Dr. Cobb: Those executives who measured high on the overload scale and also were rigid people (as measured by psychological tests) did *not* have as high an incidence of physiological strain indicators as those who were overloaded and flexible.

Dividend: How do you explain that? The Termination study showed that flexible people coped with their job loss much more effectively than those who were rigid. Yet now you tell me that rigid over-loaded people show *less* evidence of physiological strain?

Dr. Cobb: It is my hunch that rigid people are better able to deal with stress on a day to day basis in the sense that they don't even admit, or allow themselves to consider, certain strain-producing thoughts. Remember, this particular study was over a very short time period. Over the long pull, I think, flexible people will adapt. Rigid people, if pushed to the wall, break into smithereens. So I think the time element here is important in the interpretation of results.

Dividend: Did you identify any other dimensions of overload?

Dr. Cobb: Yes. We measured what we called the "responsibility dimension." Recent research has shown a relationship between certain kinds of responsibility and the cholesterol level in the blood.

Dividend: I thought cholesterol only had to do with what you eat?

Dr. Cobb: Not entirely. Diet, of course, enters in, but our research indicates that that is by no means the only element. Jack French has found that cholesterol level seems to bear a relationship to the amount of unwanted responsibility for people that the executive carries.

Dividend: In what way?

Dr. Cobb: There are two different important kinds of responsibility. One is responsibility for *things-equipment*, budget, buildings, etc.

This kind of responsibility seems to have no effect on cholesterol levels. Then there is responsibility for *people* and their work—where a manager's decisions may affect other people's lives, their job status, etc. When a manager has more responsibility for the work of others than he wants—in other words, a "responsibility overload" his cholesterol level jumps significantly.

Dividend: If you could study any aspect of the organization and mental health, what would you most like to work on?

Dr. Cobb: It would be interesting to see what could be done to restructure an organization so that it maximizes the use of individual skills and involvement of people at all levels in the decision process (within the limits of efficiency obviously) so that each individual would be contributing what he really does best. This is how we build a new organization—we write the job description and then go out and find the man that fits it. Perhaps that's why new organizations often function better than old ones. In older organizations empires have been built, rigidities have been institutionalized and change is seen as a threat. A person being shifted out of a job he's no good at might resist the change, even if it gives him an opportunity to do something he's really better at. This problem—how to overcome the rigidities that have formed in older organizations and restructure them around people and their skills—that's what I'd find interesting to study.