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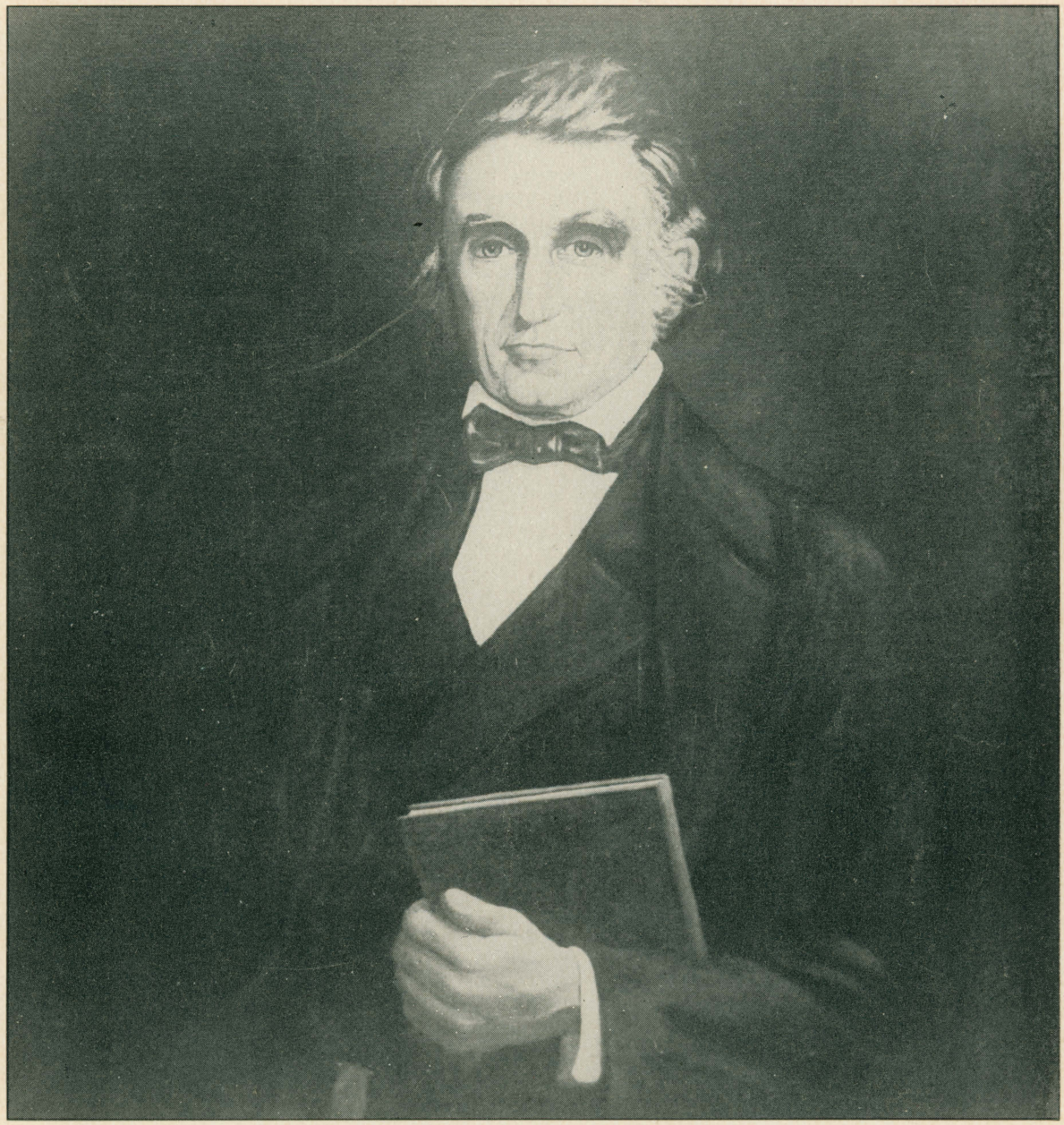


WILLIAM BEAUMONT, M. D. (1785–1853)
Tireless Pioneer

MEDICAL MILESTONES

Shot Heard Round the World

(See Cover)

Just a few weeks from now, in June, Mackinac Island, standing sentinel-like at the entrance of Lake Michigan, will suffer its annual invasion. By the hundreds, tourists and sportsmen, swarming up from warmed Midwestern plains, will descend upon the cool island and its sleepy little village.

Mackinac has had invasions before. During the War of 1812 the island and its fort were overrun by the British, who held on until the end of hostilities. Before and after that war Mackinac was invaded regularly every June by thousands of Indians and French voyageurs come to trade with John Jacob Astor's American Fur Co. Astor had made it his main distributing center for a chain of trading posts scattered through the western Great Lakes and Mississippi country.

On June 6, 1822, a typical invasion of Mackinac was in full swing. The magnificient beach in front of the village was crowded with Indians and voyageurs, their wigwams and tents. In canoes and bateaux, more were paddling in all the time. In the village trappers presented their winter's catch to the shrewd eyes of fur company officials. Waiting their turn, or having had it, others were playing rough games, swapping stories and generally carousing. A small group had crowded into the company store, which handled gaudy buckskins, moccasins, flannel shirts and the like, to brighten the spirits of the lonely trapper.

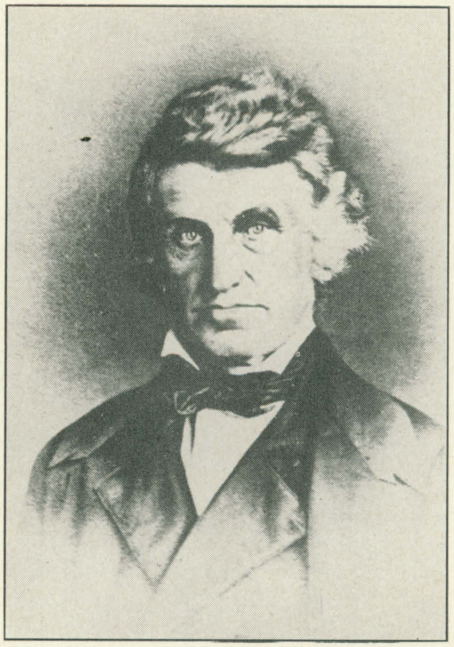
Suddenly (and accidentally) a shotgun was fired. It was a shot heard round the medical world. Alexis St. Martin, a 19-year old voyageur from Montreal, dropped to the floor, his shirt aflame. Standing just a couple of feet away from the muzzle, he had taken the whole charge, powder, duck shot, wadding in his left upper abdomen.

Old Hand. A few hundred yards away at the fort, now rebuilt and regarrisoned, was Dr. William Beaumont, Surgeon, U.S.A. Young (37), handsome, happily married, able, Beaumont had joined the Army for the war against England, had served through two years of border warfare, was an old hand at treating battle wounds. He had left the army shortly after the war for private practice, then joined up again in 1820. One reason for going back to service was an old wartime friend, Dr. Joseph Lovell. In 1818, Lovell was appointed Surgeon General of the army and promptly set about reorganizing the peace-pared medical corps. The revitalized corps had looked so attractive that Beaumont couldn't resist.

As the only surgeon in the Mackinac area, Beaumont had been allowed to practice privately. On that particular day in June it was probable that he was waiting for just such an opportunity: voyageurs lived violently.

Within minutes after the accident Beaumont was on the scene, elbowing his way into the basement store. What greeted his experienced eye depressed even the battle-hardened Beaumont. His description:

"The whole charge . . . was received in the left side . . . in a posterior direction, obliquely forward and outwards, carrying away by its force the integuments more than the size of the palm of a man's hand; blowing off and fracturing the 6th rib from about the middle anteriorily, fracturing the 5th, Rupturing the lower portion of the left lobe of the Lungs, and lacerating the Stomach by a spicula of the rib that was blown through its coat, Lodging the charge, wadding, fire in among the fractured ribs and lacerated muscles and integuments, and burning the clothing and flesh to a crisp. . . ."



State Historical Society

PHOTOGRAPH OF BEAUMONT IN 1851

"That old fistulous Alexis . . ."

Protruding from the wound was part of the lung, as large as a "turkey's egg", as well as a portion of the stomach. The latter had a hole in it large enough "to receive my forefinger" and through which tumbled particles of St. Martin's breakfast. "In this dilemma," wrote Beaumont, "I considered any attempt to save his life entirely useless."

Trouble. Beaumont cleansed the shattering wound, but in attempting to reduce the protruding stomach and lung, he ran into trouble. The membrane of the lung had caught on the sharp point of a fractured rib. He had to raise the lung, clip off the jagged point with his penknife, then return the lung to the cavity. Even then he couldn't keep it there without pressure for St. Martin was coughing.

The patient was removed to the post hospital, and an hour later Beaumont made a more thorough examination, removing, so far as possible, bits of clothing, shot, wadding, rib. He plastered a "carbonated fermenting poultice"* on the wound to slough off damaged muscles and integuments, kept the parts around it bathed with a solution of muriate or ammonia "in Spirits and vinegar." To the astonishment of all, the husky young Canadian neither struggled nor sank.

Days passed, then weeks. All the while Beaumont clung to his difficult surgical problem, and his patient clung to life. Despite efforts, the wound refused to close, developed successive abscesses, required the removal of fragments upon fragments of bone and cartilage, sloughed off rather extensive portions of lung and stomach. The 6th rib, the worst injured, started to decay, and Beaumont was forced to amputate it between sternum and spine. He used a short, narrow saw he had made.

As time went on, St. Martin gained in strength daily, had a regular appetite and slept well. The region was dressed at least once, sometimes twice a day; muscles and integuments contracted around the wound and slowly began to cicatrize. A gastric fistula developed. Food still made its exit whenever the dressings were removed.

Things were going so well Beaumont picked up a sense of humor. He wrote that once, to relieve his patient of a head pain, he administered medicine "as never medicine was before administered to man since the creation of the world—to wit, by pouring it in through the ribs at the puncture into the stomach."

More Trouble. Troubles of a different nature soon disturbed doctor and patient. At first, public funds were provided to care for the unemployed St. Martin. Now, ten months later, the governmental fathers announced that such charity could not or would not be continued. Instead, they proposed to pack off St. Martin in an open boat to his native Montreal 1500 miles away. Beaumont protested bitterly, pointed out that such rough exposure would surely kill his patient. The government remained adamant. In the end, Beaumont took

* Flour, hot water, charcoal, and yeast, changed every 8–12 hours.

the patient into his own home, made him a member of his growing family.

There he remained for almost two years, with Beaumont taking care of his every needs, dressing the wound at least once a day. By the close of the second year St. Martin had recovered enough to walk.

Beaumont, who kept admirable records on all his patients, sent a complete report of the case to his chief, Surgeon General Lovell, with the suggestion that it be published. Published it was (by mistake, later corrected, under Lovell's name) in the *Medical Recorder*. There was no immediate stir of interest.*

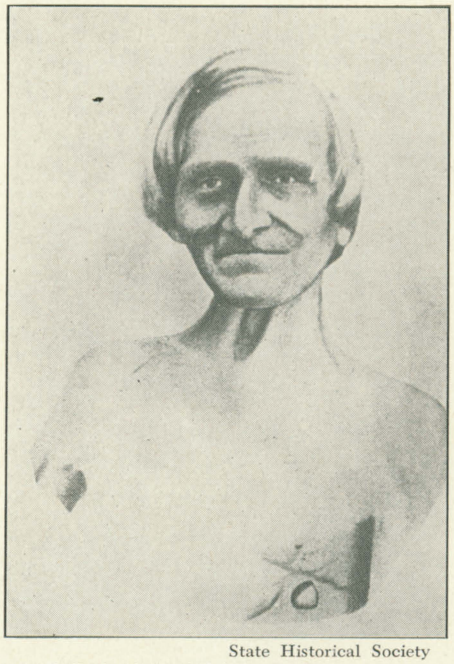
Some time in the spring of 1825 Beaumont decided to take advantage of his wonderful fistula, carry out some experiments on digestion. In that age of medicine, the knowledge of digestion was purely theoretical: attributed to body warmth and resulting putrefaction, fermentation and mechanical (maceration) action of the stomach wall. Beaumont was frustrated by isolated, ill-equipped Mackinac, and apparently appealed to his friend Lovell for transfer to some post near research facilities and colleagues.

The experiments began in May. Beaumont introduced various foods, suspended on silk string, into St. Martin's stomach, withdrew them from time to time, noting changes as the gastric juices attacked. He measured "the natural warmth of the stomach" by inserting a thermometer. He ran only four experiments in all, but even these were enough to convince him that the old theories of maceration and putrefaction wouldn't hold water (much less digest food).

Then in June Beaumont got his wish, was ordered to Fort Niagara, took family and patient with him. Two months later he went on furlough to visit his family at Plattsburgh. Again the patient went with him; evidentally Beaumont planned to exhibit Alexis to prominent scientists of the day. They were in Plattsburg only a short time when the young Canadian, seeing the border so close, suddenly took "French leave."

People Talked. The desertion surprised Beaumont, although it shouldn't have. The years of convalescence had been no bed of roses for Alexis St. Martin. His life before the awful wound had been relatively carefree. Now, whatever he did was controlled by the doctor. Now, instead of the gay, roving existence of the voyageur, he stayed in one place. He had to submit to the indignities of someone constantly prodding him in the stomach, shoving in through that orifice all sorts of objects, digestible and indigestible. Admittedly, Beaumont was kindly, but he was also curious. Sometimes he fed Alexis through the mouth, sometimes through that hole in his side. Alexis had to fast for hours, lie in certain positions for long periods, carry small bottles about in his armpits. If Alexis grew surly, there was Beaumont, taking a squint at how surliness effected his stomach. Even his pleasures were becoming less pleasurable. If he got drunk (he was turning to alcohol more and more), there was Beaumont, taking a squint at how it effected the stomach. Furthermore, people were beginning to talk, point him out as "the man with a lid on his stomach."

Brokenhearted, Beaumont made every effort to locate Alexis, but found no clues. Dispirited, he returned to Fort Niagara, wrote up his experiments, and the following January they appeared in the *Medical Recorder*. Within the year, news of his discoveries had reached Europe, been published in a leading German medical journal. Elsewhere the experiments were viewed with caution, tho interest woke up.



State Historical Society

PHOTOGRAPH OF ST. MARTIN IN 1884

"Money here is very Scarce . . ."

St. Martin remained in Canada for four years, acquiring a wife, children, supporting them by working as a voyageur. The fistula remained open. Beaumont finally tracked him down in 1829. Through friends, he had Alexis hired by the American Fur Co., and sent to Fort Crawford, Prairie du Chien, Beaumont's new post.

When Alexis arrived with his family, Beaumont wasted no time, immediately launched upon a series of 56 classical experiments that built the foundation of the study of nutrition. He tested all manner of foods: cooked, uncooked, whole, chopped, seasoned, unseasoned. His meagre laboratory equipment: thermometer, test tubes, a sand bath.

Finally in 1831 Alexis, whose wife was desperately homesick and complaining loudly, left again for Canada on the condition that he'd return when Beaumont needed him. Actually Beaumont felt that he had gone about as far as he could without further advice and help from colleagues. He secured a leave of absence to take Alexis to Europe, but the Blackhawk War cancelled his leave.

Astonishing Contract. Surprisingly, St. Martin turned up the following year at the agreed time. Taking no chances, William Beaumont made Alexis sign one of the most astonishing contracts in legal history. In specific terms, the contract spelled out that "said Alexis" would allow "said William" to "reasonably and properly" use the fistula and stomach for experimentation and exhibition for the period of one year. In return, Alexis got food, clothing, lodging, money. Shortly thereafter Surgeon General Lovell added further insurance to Beaumont's work by enlisting Alexis as a sergeant in the U. S. Army. Desertion would now be a military offense; Alexis took heed.

Again experiments were run, and literally on the run, as Beaumont wrangled leaves and transfers from the Surgeon General to consult eminent specialists in the east. A total of 116 were completed by early in 1833, many of them confirming previous tests. At this period Beaumont was sending batches of pure gastric fluid to various leading chemists for analysis. Some was sent to Charles F. Jackson, one of the co-discoverers of ether anesthesia.

The same year, 1833, Beaumont published his famous: *Experiments and Observations on the Gastric Juice and the Physiology of Digestion.* The great German physiologist Johannes Mueller hailed the book with enthusiasm. It was to become the point of departure for all modern gastric research.

For Beaumont, the high point of his career had been reached. Alexis again took off for Canada, promised to return, and never showed up. Meanwhile Beaumont was transferred to St. Louis where he spent the rest of his life. Lovell died in 1836, and Beaumont quickly ran into trouble with his successor, a strict disciplinarian. Beaumont resigned, built up a

* This was by no means the first reference in medical literature to gastric fistulae; one had been reported in Europe as early as 1600. But apparently little attempt had been made to follow such cases up.

large practice, lectured occasionally at St. Louis University.

He established contact with Alexis again, and for years, right up to the months before his death, he pleaded in vain with Alexis to come back. He wrote letter after letter, and Alexis would reply in tempting tones, ending with: "Money here is very Scarce . . ." The wily Canadian realized his unique value and was exhibiting himself to the highest bidders. "That old fistulous Alexis," Beaumont would growl—and send money. Once he even sent his son to bargain with Alexis, but it was no use; Alexis stayed out of reach.

On March, 1853, William Beaumont, careful, tireless pioneer of physiology, died at the age of 68. Alexis St. Martin, whose wound was such that it looked like he couldn't live "for 36 hours", went on to father 17 children, died when he was 83.

FIELD REPORT

Way of Medicine

That implacable educator, Webster, still insists that a clinic is for the instruction of students. So does Dorland. But to the popular eye, a clinic is simply a group of physicians practicing together. To the medical eye it is more: a fast-growing way of medicine that, in a narrowing, specialized world, casts off a new light, demanding attention.

The *Alumni Journal* asked Dr. Karl H. Doege of the solid, distinguished Marshfield Clinic, and Dr. Leslie G. Kindschi of the Monroe Clinic, a bustling newcomer of 16 years, to report on their way of medicine.

Basic requirements for the establishment of a clinic are a favorable setting, an able, congenial (this cannot be stressed too much) group of physicians, an aggressive, guiding spirit. Marshfield, in 1916, was highly favorable; its hospital was well equipped, had a reputation as a surgical center throughout north central Wisconsin. The physicians staffing the hospital were not only able, but got along extremely well together. In that year they decided to take the additional step and form a closely knit unit. The guiding spirit was Dr. Karl W. Doege (father of Karl H.).

The organization was made simple. All pooled their equipment, kept the best, disposed of the rest. Salaries (after all expenses were paid) were based on 1) the bank deposits each had made from his practice the year before; 2) the proportion each deposit bore to that of the entire group.

With the exception of one E.E.N.T., the group consisted of surgeons and G.P.s. But as the years went on, each man was gradually restricted to a particular field of choice and aptitude. Growth was slow, until, in 1927, eleven years later, the clinic erected its present headquarters. From then on it moved steadily ahead, and the clinic today is staffed by 28 physicians and one optometrist. Of that number, 23 hold board certificates or are board-trained.

Staff breakdown: six Internists, one General Practice, one Anesthesioligist, one Pathologist, two Dermatologists, three Pediatricians, two Urologists, two General Surgeons, one Thoracic and General Surgeon, one Orthopedist, two Psychiatrists, two Obstetricians and Gynecologists, one Ophthalmologist and Otolaryngologist, three Radiologists, one Optometrist.

Marshfield-born, Reporter Doege is an Internist. He took his B.S. at Wisconsin, his M.D. at Johns Hopkins, took his internship at Baltimore's Bay View Hospital, served in the U. S. Medical Corps 1918–1919, joined the Clinic shortly thereafter. He did postgraduate work in Europe 1922–23.

Taking a Chance. For some time the clinic wondered whether Marshfield (pop.: 13,000) and vicinity could use services of such a specialist as a psychiatrist. Taking the chance, a psychiatrist joined the group three years ago. Within two years he had more patients than he could possibly handle. Another joined; now his schedule is crowded; a third will soon be necessary. The same situation occurred in chest surgery. Although he was certified in General Surgery, within two years the chest surgeon found he had to curtail his general practice. Doege's conclusion: where the talent is available, along with adequate hospital facilities, patients and physicians will seek that talent, no matter how small the community.

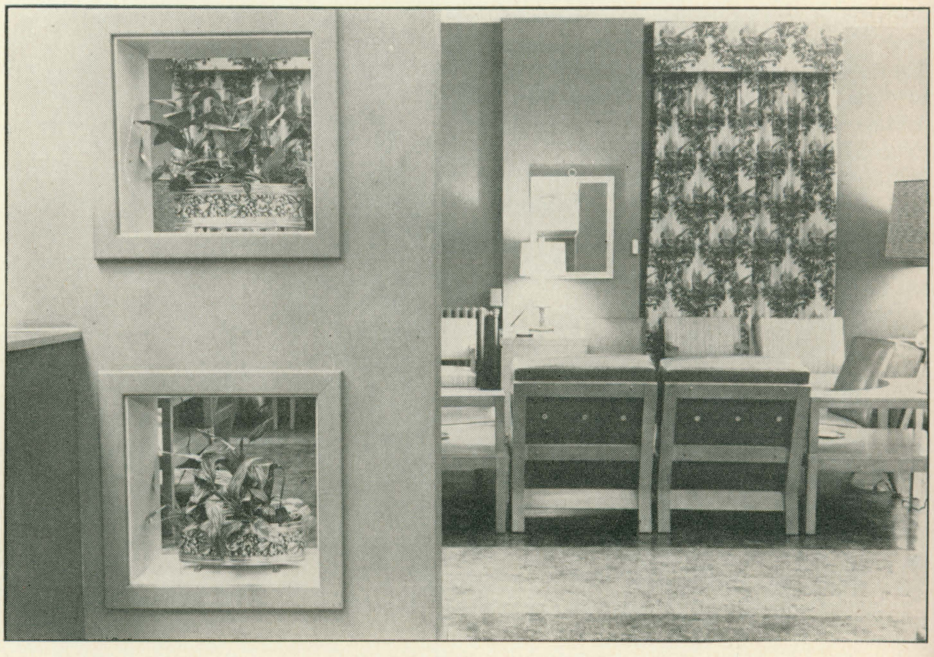
Complete X-ray facilities are maintained by the Marshfield Clinic, including deep X-ray therapy and radium therapy. Recently added was an isotope laboratory for I-131 uptake studies. A registered physiotherapist, with his special equipment, is also available. The regular lab can handle a complete study of a patient, thus saving time and expense of a hospital stay for those on an out patient basis.

Complete cost of new equipment is borne by the group. The physician who wants and can use new equipment gets it; there is no restraint on him. Broad business problems are handled by the group at a monthly meeting. Day-to-day affairs are run by a business manager, who also supervises some 70 non-medical employees.

The development of a hospital goes hand in hand with the development of medical standards in a community. The men of the Marshfield Clinic realized that long ago and contributed salaries to secure a good intern staff for local St. Joseph's Hospital (260 beds, 30 bassinets). At present, with seven internes on rotating services, half the salaries are paid by the hospital, half by staff physicians (who are not limited to the Clinic).

Happy Street. Since its inception, the Clinic has been part of the University's Medical School extra-mural teaching staff.* It's a happy, two-way street, says Doege. Not only do the students learn, but in turn, they keep

* A concept of teaching developed by Dr. Charles R. Bardeen, Medical School. Four times a year, cooperating clinics receive fourth year medical students in residence.



MARSHFIELD CLINIC
The philosophy is equality.

MONROE CLINIC
The secret is friendship.

the group apprised of new trends, and particularly new methods in laboratory techniques and uses.

Board training is now a minimum requirement at Marshfield. With it, Doege reports, has developed an interesting, new philosophy. Basis of it is that all members of the group are considered equal (i.e. training, public acceptance, personality, initiative, zest for work); they differ only in what the public pays for their services. To leaven the scale, each member now draws his salary on his service as a physician, not a specialist. It means that surgery carries a greater share of the load, but the concept is completely accepted by the group. What happens when a laggard is encountered? So far, it hasn't happened, and again Dr. Doege stresses the "close personal and professional interrelationship" which must be the foundation of any successful clinic.

The underlying idea of a clinic, Doege points out, is that it can unquestionably bring to a small community medical talent that would never otherwise be available, and it can bring it less expensively as well. For the group member, while the hours are probably less than a sole practitioner, he works with fine intensity, can devote more time to his specialty, is greatly stimulated to better medicine, surrounded by top flight equipment and equally able colleagues.

And, adds Reporter Doege, he has more opportunity "for reporting . . ."

Reporter Leslie Kindschi, born in Madison, took his B.A. and M.A. at Wisconsin, his M.D. at Harvard. He jumped almost immediately into clinical work, served as Fellow in Medicine at both Cleveland and Mayo Clinics. For a year and a half he was First Assistant in Medicine at Mayo, then joined the Monroe Clinic in 1941.

Established in the year 1939 ("not a particularly propitious one for starting a new business venture"), the Monroe group, with certain differences, follows the basic pattern.

Again the six men who formed it—two of them sons—were very close friends, had professional admiration for one another. The three oldest had long served the community as general practitioners. All were instrumental in the opening of the city's St. Clare Hospital (150 beds) in 1939.

With the new hospital to count on, their own pool of resources to back them up, the group moved into 2nd floor offices in the Insurance building and hired a business manager. The Clinic was launched. Within a year they had added an E.E.N.T. department.

War Clouds. Then the war clouds broke. From that time on, group members came, then went into military service (Kindschi with them; he served in the Navy Medical Corps 1943–46). The work load, now building up, fell heavily on those left behind, including the older members who had planned to retire once the Clinic was safely under way.

After the war, the Clinic laid its plans, immediately started to move forward. Department after department was added or expanded. By 1949, the Clinic had pushed from its orginal second floor to all three floors of the building; by 1953 an addition had to be built, increasing floor space by 50%. Today Monroe has a staff of 18, is part of the preceptorship program of Wisconsin's Medical School.

Staff breakdown: three in General Surgery, six in Internal Medicine, three in Ophthalmology and Otolaryngology, two in Obstetrics, two in Radiology and one each in Urology and Pediatrics. Twelve of the doctors are board-trained; two more are board-eligible.

The Radiology department includes a deep therapy unit, as well as a radioactive isotope laboratory. There is a completely equipped Physical Therapy section, staffed by two registered physical therapists.

Basic philosophy at Monroe is again that of equality. A man starts out as a salaried doctor and remains on probation for three years. At the end of probation, if all are agreeable, he enters the partnership. From that time on his share of the profits is gradually increased until the seventh year of partnership. Then he is on an equal plane with the others.

Outriders. A fundamental objective of the Monroe group is to maintain the traditional doctor-patient relationship, even in the face of specialization. Their internists are the outriders, taking over the general functions of the practice, particularly for local people. Backed up by the specialists of his Clinic, an internist is fitted to meet both the needs of the family doctor and modern, intensive medicine. Because Monroe is small (pop.: 8,000), patients come from a large, scattered area, and the patient-doctor relationship is stretched thin. In such instances, the group works closely with the local family physician.

Six years ago the members of the Clinic set up a training program for men interested in general practice, creating two "general practice fellowships" at the same time. Their purpose was two-fold: 1) the time had come to shift the unbalance of specialty over broad practical experience; 2) the A.M.A., with its general practice residency, in effect placed residency in the category of a second year of rotating internship. Monroe thought a far broader experience was needed than just hospital work.

The Monroe program includes office practice and out-calls, along with routine hospital work. And sometimes, the men are released for short periods to take up locum tenens with general practitioners. Not only does this training produce invaluable experience, writes Reporter Kindschi, but men see their patients as human beings, "trying to live in a sometimes hostile environment."

Monroe wants to fit into the developing pattern of medical practice in its area. "Perhaps," concludes Dr. Kindschi, "in some small way we can even help to shape it. . . ."

PROFILE

*By William P. Young., M. D. and Charles W. Crumpton, M. D.**

Atrial Septal Defect: Dx & Rx

Defects of the atrial septum are among the commonest congenital cardiac anomalies and represent the most frequently encountered congenital malformations of the heart in young adults. Curiously enough, in many patients with large atrial septal defects normal development occurs through childhood, during which period there are practically no symptoms referable to the cardiac lesion. Since the condition may be asymptomatic, suspicion may first be aroused when an x-ray of the chest, taken for some entirely different reason, shows an abnormal contour of the heart. Thus, although this malformation is present from birth, the physical signs and symptoms make their appearance with the growth and development of the individual. Consequently, although difficult to diagnose in infancy, with the passage of years the majority of patients with this malformation develop a distinctive, clinical syndrome. During infancy and childhood this defect in individuals occasionally may be characterized by cardiac decompensation and even cyanosis, associated with severe pulmonary hypertension.

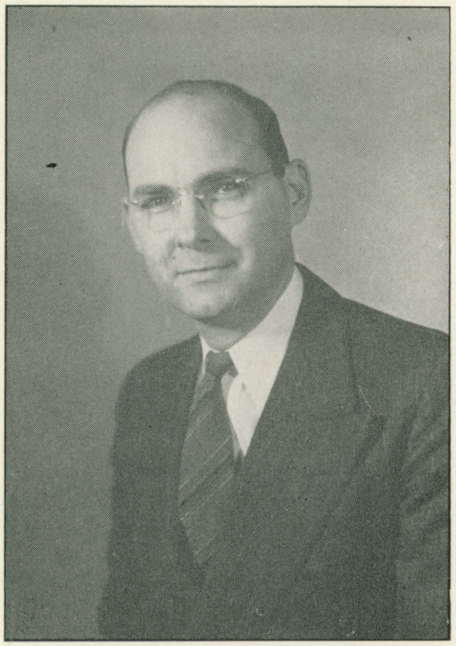
Variability in the clinical picture of patients with atrial septal defects may be explained in part by the anatomical variation which occurs in this anomaly. Kirklin *et al*† present the following classification of interatrial communications:

1. Normal interatrial communication: Valvular-competent patent foramen ovale.
2. Abnormal interatrial communications.
   - A. Valvular-incompetent patent foramen ovale.
     1. With complete posterior septal rim.
     2. With absent posterior rim and "secondary" anomalous pulmonary venous connection of right lung.
     3. With associated congenital anomalous pulmonary venous connections.
   - B. Defects of the lower portion of the atrial septum as part of persistent common atrioventricular canal.
   - C. Communications of unusual location or nature.

* Both Young and Crumpton are of the University of Wisconsin Medical School.

† Kirklin, John W., Swan, H. J. C., Wood, Earl H., Burchell, Howard B., & Edwards, Jesse E.: Anatomic, Physiologic, and Surgical Considerations in Repair of Interatrial Communications in Man, *Journal of Thoracic Surgery*, Vol. 29: 37, 1955.

Lacy Strands. The valvular-competent patent foramen ovale is present in about 25 percent of normal people. The size may vary from "probe patent" to 1 cm. or more in diameter. Normally a persistently patent foramen ovale of this type is of little importance clinically since its valvular opening remains functionally closed as long as left atrial pressure exceeds right. A valvular-incompetent patent foramen ovale is present in some persons. This is an abnormal interatrial communication that usually is crescentic in shape and related to an inadequate length of the flap of the original septum primum. These defects vary in size and location. It may be a clean hole or be traversed by lacy strands of tissue. The orifices of the right pulmonary veins in the posterior wall of the left atrium are



WILLIAM P. YOUNG, M. D.
Suspicion may be aroused . . .

near the atrial septum and thus are in close proximity to an atrial septal defect. The orifices of the left pulmonary veins are considerably removed from the septum since they connect to the left lateral wall of the atrium.

Many atrial septal defects, although large, possess a complete rim of septal remnant. When these defects are located near the inferior or superior vena cava, the septal remnant may be incomplete in the vicinity of the orifice in question. When the posterior rim of the septal remnant is incomplete, the orifices of the right pulmonary veins lie to the right of the plane of the septum, resulting in an atrial septal defect and "secondary" anomalous pulmonary venous connection. A true congenital anomalous pulmonary venous connection of the right or the left lung may be associated with this type of atrial septal defect. And [illegible]s pulmonary veins may drain into the right auricle directly or indirectly via the superior or inferior vena cava or coronary sinus.

Defects on the lower portion of the septum adjacent to the mitral and tricuspid valves are referred to as ostium primum defects, and those on the upper portion of the septum are known as septum secundom defects. In defects located in the lower portion of the atrial septum, the rings and the valvular leaflets themselves may be cleft and the defect may extend down to involve the upper portion of the ventricular septum; this condition is called "persistent common atrioventricular canal". When the atrial septum is virtually nonexistent, the anomaly is referred to as atrium communis or cortriloculare.

Nothing Specific. In its characteristic form, the atrial septal defect is readily diagnosed clinically, but because of the variability in auscultatory phenomena, it is frequently not recognized. At birth and in infancy the clinical findings are subject to wide variation. There may be no murmur or there may be a loud systolic murmur maximum over the second left interspace or along the left sternal border. There may be nothing specific in this age group to differentiate this murmur from the systolic murmur associated with atypical patent ductus arteriosus or one caused by a ventricular septal defect. Later the infant may develop a thrill, but this also is of no particular diagnostic significance. Since the condition is often asymptomatic, suspicion may be first aroused by the occurrence of cardiac arrhythmia (paroxysmal tachycardia), difficulty in gaining weight, and the increased frequency of respiratory and pulmonary infections. Typically cyanosis is not evident since the shunt is from left to right. The pulmonary second sound may be accentuated, and functional incompetence of the pulmonary valve may eventually develop and manifest itself by a Graham–Steele murmur. Evidence of right atrial, right ventricular, and pulmonary arterial enlargement, with occasional aneurysmal dilatation of the pulmonary artery, can often be demonstrated roentgenographically. The aortic knob is small. Fluoroscopically, accentuated pulmonary vascular markings and a hilar dance may be demonstrated. The typical electrocardiogram pattern is incomplete right bundle branch block. One may also observe tall peaked P-waves, prolongation of the P–R interval, and right axis deviation. It is worthy of emphasis that, in infancy, one seldom finds a large ductus causing clinical difficulty and with no murmur. Also,

one seldom finds a [illegible] ventricular defect with no murmur; however, a large atrial septal defect may occur without a significant murmur. The electrocardiogram shows right axis deviation and incomplete right bundle branch block without the picture of marked right ventricular hypertrophy. This is a situation in which the right ventricle is circulating a large volume of blood with normal or only slightly increased pressure. There is no specific clinical sign which differentiates the ostium primum from the secundum type defect; however, with the so-called ostium primum defect, as opposed to the usual atrial septal defect, there may be observed a greater degree of left axis deviation in the extremity leads, signs of right and/or left ventricular hypertrophy in the precordial leads and a murmur which is more like that of a ventricular septal defect.*

Something Specific. Fortunately, these anatomic variations cause specific physiologic findings that frequently permit their pre-operative identification. Cardiac catheterization reveals quantitative data which permits an estimation of the pulmonary and systemic blood flow, magnitude of the shunt, pressures from each cardiac chamber, including the pressure gradient existing at the atrial level, pulmonary artery pressure, resistance to blood flow through the lungs, and the level of systemic arterial oxygen saturation. Physiologic data from patients with an uncomplicated atrial septal defect indicate that systemic flow is typically normal in this condition in the absence of cardiac failure, but that pulmonary blood flow is characteristically increased. In most instances, the pulmonary arterial pressure shows a slight to moderate elevation above the normal range.

In uncomplicated atrial septal defect, the flow across the defect is predominantly from left to right and is often of great magnitude. By means of the indicator-dilution technique, Wood† has been able to demonstrate preferential flow of blood through the defect from the right lung in cases of defects of the type characterized by a valvular-incompetent patent foramen ovale without either "secondary" or congenital anomalous pulmonary venous connection. Thus, in the usual case of atrial septal defect, most of the blood streaming into the left atrium from the left pulmonary veins goes through the adjacent mitral valve into the left ventricle, while a smaller amount is shunted across the septal defect. In contrast, a greater proportion of the blood entering the left atrium from the right pulmonary veins flows across the anatomically adjacent defect in the atrial septum, and a smaller amount continues across the left atrium to pass through the mitral valve.

In cases of atrial septal defect with absence of the posterior rim associated with "secondary" anomalous pulmonary venous connection of the right lung, indicator-dilution curves recorded after injection of dye into the right pulmonary artery indicate that an extremely small amount of blood from the right lung goes to the left atrium and that almost all of it traverses the right atrium to pass through the tricuspid valve and recirculate through the lungs. In instances of associated congenital anomalous pulmonary venous connection, the dilution curves recorded after injection of dye into the anomalously connected lung passes into the right atrium and thence again to the pulmonary circulation.

CHARLES W. CRUMPTON, M. D.
. . . for an entirely different reason.

Left to Right; Right to Left. Although the over-all shunt in most cases of atrial septal defect is from left to right, there is frequently a small right-to-left shunt of blood entering the heart from the inferior vena cava, which lies close to the defect. This has been demonstrated by injection of T–1824 into the inferior vena cava. In certain cases, a small right-to-left shunt also occurs from the superior vena cava which lies relatively far from the defect.

A separate category consists of cases in which there is predominantly right-to-left flow across an interatrial communication with consequent cyanosis. This group usually includes atrial septal defect with severe pulmonary hypertension, atrial septal defect pulmonary stenosis, and atrial septal defect with Ebstein's malformation of the tricuspid valve.

Certain indications for operation in patients who have atrial septal defect are recognized. It is to be emphasized that conclusions in this regard must be considered tentative and will require revision in the light of further experience.

Patients who have a left-to-right shunt in excess of 50 per cent of the pulmonary blood flow are considered as possible candidates for operation. Surgical intervention appears particularly indicated when symptoms are present or when the shunt is even more excessive.

When the pulmonary arterial pressure is considerably increased, with systolic values approximating the systolic pressure in the systemic circulation, large left-to-right shunts are usually absent; and either a mixed or a completely right-to-left shunt may be present. When cyanosis is associated with a right-to-left shunt in the presence of only an atrial septal defect, attempted closure of the defect is accompanied by great risk to the patient and constitutes a contraindication to closure.

Right to Left; Left to Right. Atrial septal defects occur in association with pulmonary stenosis in some patients. Usually the flow across these defects is from right to left, but several cases of bi-directional or pure left-to-right shunts have been demonstrated. When the atrial shunt is from right to left with consequent cyanosis accompanying pulmonary stenosis, it is considered beneficial to close such defects at the time of pulmonary valvulotomy.

There are at least four well established techniques available to a surgeon for the closure of atrial septal defects.

1. External suture technique: Cohn, in 1947, sutured an area of atrial wall to experimentally produced defects and cut this area of wall free. Modification of this principle by suturing the redundant lateral wall of the right atrium to the edges of the defect has resulted in the clinical method of external suture used by Bailey in 1953. Gross, in the same year, sutured the posterior atrial wall at the superior margin of the defect to the lower margin of the defect.

2. Atrial well technique: Gross, in 1953, described a method involving the suturing of a rubber well to the wall of the right atrium. When the atrium is opened, blood comes up into the well to a level equal to the pressure in the right atrium and suturing of the defect is carried out by blind palpation through the blood-filled well and atrium, but the suturing is

* Cardiovascular Surgery, *Henry Ford Hospital International Symposium.* W. B. Saunders Co., 1955.

† Ibid.

direct and not through the external wall of the atrium. Kirklin has used this technique excellently, to close atrial septal defects by suturing polyvinyl sponge into the defects.

3. Circumferental ligation (Sondergaard Technique): Murray, in 1948, attempted to place a mattress suture in the septum to close defects. Sondergaard, in 1952, successfully applied this mattress suture by preceding the placement of the suture with a dissection between the right atrium and the right pulmonary veins. Crafoord, in 1953, improved the application of the mattress suture by placing it circumferentially about the defect. Sondergaard then modified this improvement so the technique is now the placement of a ligature by blunt dissection about the defect between the atria which have been partially dissected apart. The method can be used to close at least some persistent ostium primum defects.

4. Hypothermia with temporary cessation of circulation: Bigelow, in 1950, used hypothermia with inflow occlusion for temporary cessation of circulation, experimentally, to permit direct visual approach to the atrial septum. Lewis, in 1953, first successfully used this method in correction of an atrial septum defect in a human and has used this method routinely since. Sway, also in 1953, used hypothermia and direct visual approach and has been using it routinely since.

5. Extracorporeal circulation: Extracorporeal circulation developed by Gibbon and Lillehei and others has been used to permit direct vision surgery in the dry heart but, at present, technical difficulties make this technique unwarranted for use in uncomplicated atrial septal defects although this technique may have a real place in the closure of ostium primim defects and associated common atrioventricular canals.

Experience & Experiments. At present the majority of surgeons decide preoperatively to use the method of closure with which they are most experienced, the experience having been obtained with the method that to them seemed to offer the most important advantages. Experimental work with dogs lends itself very well to the creation and closure of atrial septal defects in all positions except that of the ostium primum defect and associated atrioventricular canal. We have used dogs extensively in order to help evaluate the above methods. This work was in part supported by research funds from the Wisconsin Alumni Research Foundation.

It would be a happy circumstance if the selection of method could depend upon the findings at time of digital exploration of the atrial septum and pulmonary veins. This is not practical because the commonly used methods of creating hypothermia are hardly applicable once the chest is opened. Furthermore, the type of thoracotomy incision varies with the technique of closure to be used. Any method carried out under direct vision in the dry heart requires a bilateral anterior thoracotomy with transverse division of the sternum, while the other methods are more easily carried out through a right lateral thoracotomy.

William P. Young, co-author of Profile, took his M. D. at Univ. of Wis., 1941, interned at Kansas City's (Mo.) Research Hospital; returned to Univ. of Wis. as resident in Surgery, U.S.P.H.S. Trainee, instructor in Surgery; became assistant professor of Surgery, 1951.

Charles W. Crumpton, co-author of Profile, took his M.D. at Tulane, 1942, his internship and residency at Univ. of Wis.; became Research Fellow, instructor in Medicine, Robinette Foundation for Cardiovascular Research, Univ. of Pa.; returned to Wisconsin as assistant professor of Medicine, 1951, became director, Cardiovascular Research Laboratory.

Each method of closure has certain advantages and limitations. The external suture methods have the advantages that they are carried out without materially interfering with the circulation during the procedure, without much opportunity for the introduction of air emboli, without increasing the irritability of the ventricle, and without the necessity for bilateral thoracotomy. This method has the rather serious disadvantage that the surgeon can see neither the defects nor the adequacy of the closure, having to rely entirely on feeling with one finger and cardiac catheterization data which may be collected during surgery. The limitations of Braille as compared with vision have been used as an analogy. Any closed method has the additional disadvantage that plastic material or tissue grafts cannot be used to close defects that cannot be satisfactorily closed by external suture.

Natural Sequence. The use of the atrial well method has the advantage that grafts can be used. There is a further advantage that it can be used as a natural sequence of procedure when exploration and even attempts at external suture indicate the necessity for grafts to close the defect. It has the same disadvantage of lack of vision that the closed methods have. Excessively high atrial pressures preclude its use, but there may be some question regarding the advisability of closure of an atrial septal defect in the presence of such a high pressure.

The mattress suture ligation, called circumclusion by Sondergaard, has the advantages of a closed method with considerably less disadvantages brought about by lack of vision. This method will close defects that would require grafts through an atrial well and not be satisfactorily closed by other external suture methods. There is a further possibility that the Sondergaard technique may be satisfactorily used in the closure of the ostium primum defect more often than other presently available methods.

Closure of atrial septal defect under hypothermia with cessation of circulation has the very great advantage of direct vision. A direct vision method is the most likely to accomplish complete closure of the defect. Very little is accomplished by partial closure of atrial septal defects even though the remaining defect is quite small. The disadvantages of this method are the increased susceptibility of the heart to ventricular fibrillation, the limited time to accomplish the closure, the possibility of air emboli, the necessity for bilateral thoracotomy, some increase in difficulty with serious postoperative bleeding, and usually the necessity of having to decide to use hypothermia before starting the exploration. This sizable list of disadvantages might discourage one in the use of this technique.

However, the serious disadvantages have been almost completely overcome. Susceptibility to ventricular fibrillation has been greatly reduced by the use of neostigmine, as shown by Swan, controlling the blood pCO_2 as demonstrated by Lewis, and perhaps infiltrating the sinoauricular node with local anesthetic agents as done by both Kahn and Schumacher. Furthermore, defibrillation is almost always successful. The permitted ten minutes with the heart open is more than adequate for a well planned closure of a thoroughly identified atrial septal defect other than a persistent ostium primum defect or associated common atrioventricular canal. Fortunately these defects are not common.

Safety Factors. As for air emboli, clamping the aorta very close to the heart keeps air out of the aorta and coronary arteries, and the chambers of the heart can be filled with solution or blood before final closure, virtually eliminating air emboli. Furthermore, manual compression of the heart will work air emboli from the coronary arteries, avoiding ventricular fibrillation from this cause in the majority of cases, should this complicating fac-

tor arise. A bilateral thoracotomy with transverse separation of the sternum has proved to be well tolerated with no more and frequently less postoperative symptoms than a posterolateral thoracotomy. Meticulous ligation of potential bleeding points has reduced the possibility of serious postoperative bleeding to a frequency no greater than a thoracotomy without hypothermia. Swan uses an additional safety factor in rewarming the patient with diathermy prior to closure of the thoracotomy which permits detection of bleeding from uncontrolled sites which did not bleed during hypothermia. Diathermy, if used on tissues with decreased circulation, must be used with extreme care to prevent burning. In the hands of those experienced in the use of direct vision closure with hypothermia it is seemingly the best method of closure of atrial septal defects; so the decision to use this method before beginning the procedure really offers no problem.

Extracorporeal circulation is, at present, too complicated to warrant its use for the closure of the usual type of atrial septal defects when hypothermia will permit direct vision closure. Perhaps an extracorporeal circulation technique should be set up for use when an ostium primum defect is suspected, because of high pitched systolic murmur at the left lower sternal area and/or the apex, and left axis deviation and indications of left ventricular hypertrophy on the electrocardiogram. These clinical and laboratory findings in the presence of the ostium primum defect have been noted by Blount, who believes them to be due to deformity of the mitral valve in the floor of the defect.

When an ostium primum defect is encountered with the patient in a hypothermic state, one might best retreat although it is possible to extend the incision to the right, rotate the patient to the left, and carry out the necessary dissection for the Sondergaard procedure with this less than ideal exposure. Of course, rewarming would be indicated before carrying out the additional dissection because of the susceptibility to ventricular fibrillation while hypothermia exists.

Excellent Work. Before any attempt to close atrial septal defects, the surgeon must be familiar with the position of the conduction system in relation to the various septal defects. One is referred to the excellent work of Watkins and Gross* who applied the techniques of Widran and Lev in dissecting out the conduction systems in a series of normal hearts with variously located atrial septal defects. In normal hearts the atrial ventricular conduction system is found below a line extending between the coronary sinus and the central fibrous body in the tricuspid annulus.

In the presence of inferior defects, common atrium defects, and ostium primum defects, the conduction system lies beneath the endocardium on the right atrial side of the shelf created by the tricuspid and mitral annuli. Therefore, sutures should be placed into the left atrial side of the shelf more on the mitral annulus than the tricuspid annulus. In the presence of the midatrial margin defects and the superior margin defects, the conduction system lies well away from the defect and should offer no problem. Continual electrocardiogram supervision is desirable during this phase of the procedure; however, a block may appear until the postoperative period.

With any of the methods of closure, it is not difficult to correct the associated defects of anomalous drainage of the pulmonary veins or mitral stenosis. Suturing is carried out so that the anomalous veins are directed into the left atrium. At times it is necessary to create a septal defect near the anomalous veins and then suture the lower margin of the defects so that the atrial septum is completed to the right of the anomalous veins. Stenotic mitral valves can be opened with a finger extending through the septal defect prior to closure of the defect.

When pulmonary stenosis and an atrial septal defect exist together, the pulmonary stenosis is the more important of the two defects and should be relieved before closure of the atrial septal defect is carried out. Direct vision surgery on the pulmonary valve with hypothermia is the most successful. Frequently the septal defect will be found to be only a valvular-competent patent foramen ovale requiring no closure, but we have encountered both a high marginal defect and a valvular-incompetent patent foramen ovale in association with pulmonary stenosis.

We have found fibrotic pericarditis, unexpectedly, in two patients during surgery for closure of atrial septal defects. Of course, it is present in most of the dogs undergoing closure of created defects. This complicating situation interferes with any technique of closure but is much less of a problem with direct vision closure under hypothermia than with the other techniques.

Work with dogs, evaluation of our clinical cases, and study of data from other clinics, lead us to the rather definite conclusion that direct vision closure is the most successful in accomplishing complete closure of the usual atrial septal defects and is accompanied by no more morbidity or mortality than the other, less satisfactory, methods.

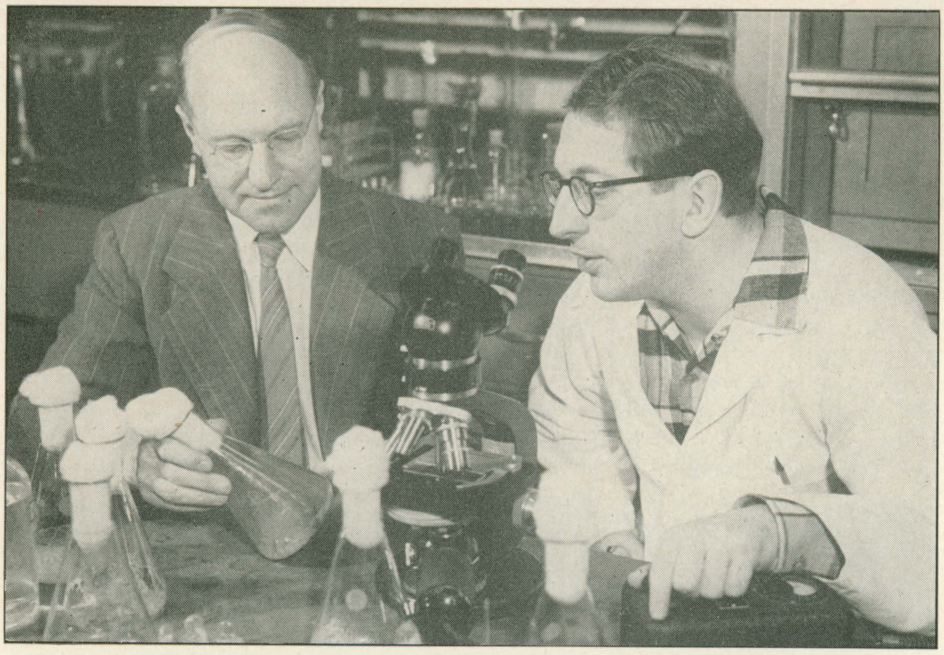
* Watkins, Elton, Jr., Gross, Robert E.: Experiences with Surgical Repair Atrial Septal Defects, *Journal of Thoracic Surgery*, Vol. 30: 469, 1955.

AMBASSADOR MEHTA (CENTER) AT McARDLE
Probing and absorbing.

SCHOOL SCENE

Honors & Events

¶ Geganvihari L. Mehta, Indian ambassador to the U. S., has a reputation for getting to the heart of the matter. Before his diplomatic career, he was editor of an English-speaking paper in Bombay, spent 20 years as chairman of the Indian Steam Navigation Co., served as member of



DR. RUSCH (LEFT) & DR. E. GUTTES (GERMANY)

Direct and random . . .

India's top level National Planning Council 1950–52. Recently he set out to tour 45 U. S. campuses where some 2,000 Indian students are enrolled. Purpose: to find out what and how his countrymen are doing. He visited the University of Wisconsin (90 Indian students) last September, spent two days probing and absorbing. A high point: conference with the chest people of the McArdle Laboratory.

¶ May 1: Dr. Ben M. Peckham assumed chairmanship of Wisconsin's obstetrics and gynecology department. Previous post: chairman of the same department at Northwestern, where he had built a distinguished record.

¶ Robert E. Parks, Jr., assistant professor of pharmacology, was granted the coveted Markle Scholarship in Medical Sciences.

¶ On demand of friends and associates, the John E. Gonce Memorial Fund, honoring the late chairman of the pediatrics section, has been established. (Donations may be made through Dean Bowers.) Also in Dr. Gonce's honor: the Well Baby Clinic, the Child Guidance Clinic and the General Out Patient department of the pediatrics section, have been designated the John E. Gonce Memorial Clinics.

¶ May 12: the Medical School held its first conference on premedical education. Educators from the university, small colleges and high schools throughout the state, attended. The speakers: Dr. Aura Severinghaus, Columbia College of Physicians & Surgeons, and Dr. Dean Smiley, secretary of the Association of American Medical Colleges.

SCHOOL REPORT

*By Harold P. Rusch, M. D.**

Cancer Research at McArdle

Two general approaches are being employed by investigators in the field of cancer research. One of these is the direct but more or less random approach: to test as many types of compounds as possible on a wide variety of tumors in animals in the hope that some of these drugs may effect cures of certain types of cancer. Any substance effective in the control of animal cancers is subjected to clinical testing, providing its toxicity is not too great.

The other approach is more remote but promises to lead eventually to the control of cancer: the study of the chemistry inside the cell, both normal and diseased. When sufficient basic information on differences between normal and tumorous tissues is available, it should be merely a question of time until the uncontrolled growth of the latter can be regulated, just as the growth of undesirable weeds can be limited with weed killer, and of bacteria with antibiotics.

Both of these approaches are being pursued at the University of Wisconsin. The fundamental study of the biochemistry of tissues has been carried on at the McArdle Memorial Laboratory since its opening in 1940. More recently, the screening of compounds for possible chemotherapeutic effects in mice has been started at the Wisconsin Alumni Research Foundation in association with the McArdle Laboratory. In addition, several promising compounds are being tested clinically at the University Cancer Research Hospital on a variety of cancers in patients. Along with such clinical tests and in conjunction with the McArdle Laboratory, the metabolism of these compounds is being studied to determine what proportion of the substance administered reaches the tumor and how rapidly it is eliminated from the body.

* Director, McArdle Memorial Laboratory for Cancer Research.

Close Liaison. The location of the McArdle Laboratory, adjacent to the Cancer Research Hospital, permits close liaison to be maintained on any mutual projects. The laboratory personnel at McArdle includes eight permanent staff members, who hold appointments in the Medical School. Approximately 25 postdoctorate fellows are receiving training in cancer research at our laboratory. Many of these come here from other countries. At present we have representatives from India, Brazil, Germany, Israel, France, Peru and Norway working with us. The postdoctorate fellows have proved to be of great value in our research program, since they devote their full energies to study and research, and they have also enriched the laboratory with their varied backgrounds and experiences. In addition, we have approximately twelve graduate students studying for the M.S. and Ph.D. degrees in our department; their training will enable them to carry on medical research in almost any aspect of the field because the techniques involved are essentially the same for all biochemical-medical research. We also have eight full-time research assistants, who help with various technical aspects on our projects.

Only a small portion of the financial support of the McArdle Laboratory comes from State Legislature. Most of the funds are obtained through private donations or from grants given by the American Cancer Society and the U. S. Public Health Service.

The research projects being conducted at the McArdle Memorial Laboratory comprise a variety of fundamental studies: the biochemistry and mechanism of cancer formation, the biochemical properties of normal and tumorous tissues, the effects of hormones and of inhibitors on cellular metabolism, growth and differentiation as studied in tissue culture, etc. For the study of these problems, we have at our disposal today a number of invaluable techniques which are being used by research workers in many fields and which will be discussed briefly in relation to cancer research.

Fractioned Cells. One such technique is the fractionation of cells by

centrifugation into their component morphological units. By this method it is possible to obtain from a homogenized tissue, such as liver or tumor (in which the cell membranes have been disrupted without destruction of the intracellular components of the cells), a number of separate fractions. As the rate of centrifugation is increased, smaller and smaller particles will be sedimented. Thus it is possible to obtain one fraction consisting only of nuclei, another containing smaller cell particles (mitochondria), another with still smaller particles (microsomes), with the soluble constituents of the cell remaining in a supernatant fraction. The chemical properties of the individual fractions for any tissue then can be studied and comparisons made. Example: between tissues from normal and from tumor-bearing animals, or between tissues from untreated and treated animals.

It is also possible to dissect cells in a chemical sense with the use of radioactive isotopes. One common technique is to label a known foodstuff, called a precursor, which is used as a building block for the synthesis of substances within the cells. For instance, glucose can be labeled by replacing one of the carbons of the molecule with radioactive carbon; such labeling makes the glucose, or substances containing the radioactive carbon of the glucose, detectable even in minute amounts by means of sensitive Geiger counters. After the radioactive glucose is injected into an animal, it can be traced through the maze of complex reactions which may convert some of it to fat, some to carbohydrates like glycogen, some to carbon dioxide and water, etc. The radioactive carbon dioxide is exhaled and can be detected in the breath, and the various metabolites can be isolated from the tissues and identified. For example, some of the labeled glucose will be converted to lactic acid, and normal and cancer tissue have been compared as to amount and rate of production of this substance. In the *absence* of oxygen, lactic acid accumulates in normal and in cancer tissues; in the *presence* of oxygen, normal tissue metabolizes the lactic acid but cancer tissue still produces it in considerable amounts. This suggests that the enzymes which metabolize lactic acid are reduced in cancer tissue as compared with normal tissue. It required years of research for this difference between normal and cancer tissue to be clearly established. In spite of much effort, it has not been possible to utilize this particular difference in the treatment of cancer. Such findings serve as a stimulus, however, in the search for other metabolic reactions in which cancer tissue differs from normal tissue. And it is to be anticipated that one or more of these altered reactions will give us a key to the effective treatment of cancer. If it can be established, for instance, that a certain metabolic pathway is essential for the uncontrolled proliferation of cancer cells (but is not vital for the survival of normal tissues), then it should be possible to inhibit the tumor by selecting a compound which will block the specific reaction on which the tumor is dependent.

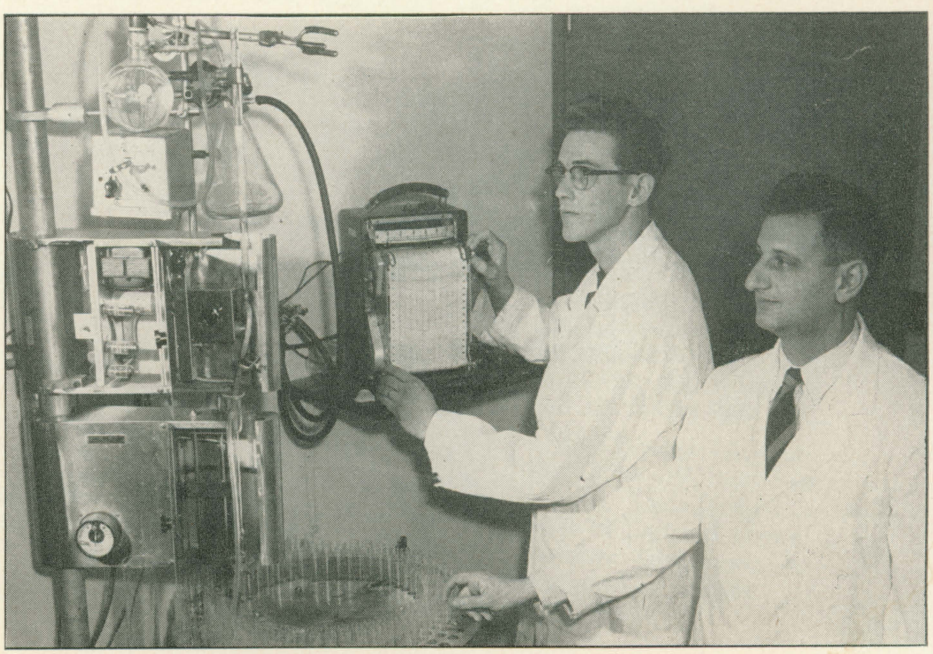
In the separation and identification of the various metabolites obtained in studies on normal and malignant tissues, another valuable technique is utilized, namely, chromatography. An example of a chromatographic column is a glass cylinder packed with a powdered resin which has a very high affinity for the substances which we may wish to separate from one another. When a mixture of these substances is poured through the column, they will adhere to the resin. Some of these substances may be washed off the column with dilute acids, others with stronger acids. By gradually changing the concentration of the acid from low to very high, each substance will be removed from the column when the concentration gets to the appropriate level for that compound. This technique has a wide application in chemical research and, like the other two techniques briefly discussed above, is being used every day in our laboratories.

From the viewpoint of the medical practitioner faced with cancer patients needing immediate treatment, much of this discussion may seen quite remote. But the gap between the disease and its effective treatment is steadily being narrowed and will eventually be bridged as a result of the intensive efforts of cancer research teams throughout the country.

* * *

Dr. Harold P. Rusch, who contributed the School Report, headed into cancer research almost from the beginning. Born in Merrill, Wis., in 1908, he entered the University in 1926, took his M.D. in 1933. After internship, he held a brief appointment as instructor of physiology, then, in 1935, he was granted one of the three new Bowman Cancer Research Fellowships. During the next five years his research was interspersed with visits and studies at leading cancer centers in the U. S. and Europe. When the McArdle Laboratory opened in 1940, Rusch came in as department head, moved up to director in 1946.

He has served as editor of *Cancer Research*, board member of the American Association for Cancer Research (1952–54), was elected president of the association in 1954. He has been on the Committee on Growth of the National Research Council, and in 1954 was appointed to a four year term on the National Advisory Cancer Council. Like many a medical man, family vacations are made to coincide with professional meetings. In his spare time Rusch dabbles away at photography and geology. Back-of-the-mind ambition: sailing on Madison's beautiful Lake Mendota.



McARDLE'S AUTOMATIC FRACTION COLLECTOR
. . . or remote and eventual?

THE UNIVERSITY OF WISCONSIN
MADISON 6

THE MEDICAL SCHOOL
OFFICE OF THE DEAN
418 NORTH RANDALL

May 4, 1956

Dear Alumnus:

A man is known by the company that he keeps; a medical school is known by the achievement of the alumni that it has educated. Further, alumni are known, in part, by the excellence of the Medical School from which they have graduated. Thus, alumni and their medical alma mater are a unit of accomplishment.

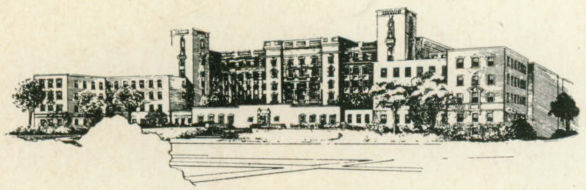
The University of Wisconsin Medical School is justifiably proud of the accomplishments of its alumni as practitioners and as teachers. The excellence of the practice of medicine by our alumni has been documented by laymen, by medical societies, and by State Boards. The achievement of our alumni as educators is indicated by the statistic that Wisconsin stands among the first five medical schools in the country whose alumni are engaged in full-time teaching careers. The very diversity of the success of our alumni is a source of great pride to the University of Wisconsin.

The alumni determined that a formal alumni organization should be organized and I am delighted that plans have moved ahead so successfully. A strong Alumni Association can be a source of wise counsel and support for a strong Medical School. In time, the Medical School is anxious to continue and expand its relations with the alumni through its educational, research, and service programs.

I look forward to a much closer association with you through the Alumni Association.

Yours sincerely,

JOHN Z. BOWERS, M.D.
Dean



FROM THE EDITORS

Birth of a Baby

Doctors are a breed apart from other men. Each, as part of his career in medicine, has been present at least once at the birth of a baby. Few other men can say that.

Today, May 18, you witness another baby being born: the *Wisconsin Alumni Medical Journal.* Like all babies, it was conceived long ago, took a while to pass from embryonic stage to final form. There were the usual labor pains (both false and real) in the usual late evening hours. Both editors and printers paced up and down, seized with worry: would it be born on time, would it look all right, appear "normal"?

The *Wisconsin Alumni Medical Journal* is *your* baby. Right now it is small, but there are hopes that it will gather strength, and grow up into a large edition. Meanwhile, you can contribute to the care and feeding. Material to satisfy the hunger pangs can come in two ways. If you have time to write a paper, write one. If you haven't, you can still report (as did Reporters Kindschi and Doege). Don't worry about sentence structure, whether your adjectives are actually adverbs, or you left a participle dangling some place. Just write it down in informal style. We'll handle the cooking and straining of the food. The main point: contribute material when you're asked. It's *your* baby.

Editor in Chief
---------Dr. Robert C. Parkin

Managing Editor
----------Keith A. Hinsman