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MEDICINE AT WORK

HEALTH IN THE HEAVENS

DOWN-TO-EARTH SPACE DOCTORS ARE TACKLING TOMORROW'S CASES TODAY

It seemed a long way down the thermometer from home at Glendale, Calif., as Dr. Robert Garrett wiped his brow in an airplane over Alaska early this year. Jouncing beside him was a casket box, taped airtight and hooked up to oxygen tanks. A virtually pulseless heart attack victim lay inside.

This was Dr. Garrett's own idea of a mobile oxygen tent, devised from limited materials back at Valdez, Alaska. Physician and patient survived the below-zero flight to Anchorage, all right, and later Dr. Garrett described the lifesaving coffin case as "a desperation device that worked."

Unknowingly, his contraption was conceived in much the same way as was another kind of sealed chamber several thousand miles southeastward near balmy San Antonio, Texas. There, in a basement at the Randolph Air Force Base School of Aviation Medicine, another doctor locks a man tightly in a cleverly built container. Medical creativeness to help a man live in the face of danger is the same in both cases, but here comparison shades into the wider realm of preventive medicine.

The School of Aviation Medicine several years ago developed a light-weight respirator for air evacuation. Now standard in the armed forces, it is used by the Military Air Transport Service and is available to civilian patients through the National Foundation for Infantile Paralysis.

But the unique chamber in Texas is not a respirator. Resembling a furnace with portholes, it is a space-cabin simulator. Its designers are confident that in not too many years a tank very much like it—but made of aluminum instead of steel—will be rocketed into outer space as a self-sustaining "little earth" for history's first human space dweller. Meanwhile, physicians are conducting a seemingly endless series of tests to protect this no. 1 space man, whoever he may be. They are probing survival needs at an altitude where blood effervesces. They are testing muscular coordination, vision, and blood pressure in a state where gravity vanishes. They are puzzling over the delusions which cobweb human consciousness under the stress of relentless concentration upon an instrument panel. They are trying, too, to second-guess the physiological hurts which may or may not be inflicted by cosmic rays beyond the earth's atmospheric blanket.

These physicians are not romping recklessly in the wispy world of science fiction, making playful studies of such fantasies as antigravity belts and disintegrator pistols. Theirs is an earthly, practical assault on space medicine problems of the immediate future—indeed, of today. For already, man has soared to a height of 24 miles. This uppermost flight, experienced for a few minutes in a rocket plane last fall by Air Force Capt. Iven C. Kincheloe (simulated heights in ground chambers sent another officer "up" 38 miles), is well within what aeronautical scientists call our "partially space equivalent zone." The fraction of 1% of air at that level (where nothingness is "99 and 44 one-hundreths per cent pure") acts as a virtual vacuum upon the unprotected human body. Had Captain Kincheloe embarked on a trip to Mars, he would have encountered the same physiological hazards of oxygen supply and air pressure; only the duration differs.

"Space Travel Just Around the Corner"

Comparatively recent advances in physics, chemistry, metallurgy, rocketry, and electronics are thrusting the space age upon us more suddenly than many of the most optimistic observers might have dared predict. Five years ago, so responsible a person as the surgeon general of the U. S. Air Force would not have risked linking his name or office to serious public discussion of space travel. Yet, that was the very topic of Major Gen. Dan C. Ogle's address last month before the Southern Research Institute in Birmingham, Ala. He said: "Science is moving so rapidly that it is difficult to distinguish between reality and science fiction. . . . From the interests of aviation medicine and human engineering, space flight is now upon us. . . . Rocket flight involving space travel from one point of the earth to the other is just around the corner."

At every phase of space research, medicine is there. For no space craft is completely efficient unless it carries a pilot healthy enough to tell his observations. Unmanned rockets may radio back some data, but so far there is no substitute for man as the finest emergency control system ever devised. What is more, everything about the effect of space flight on the human body has a distinct value to generations of people who will spend the rest of their lives on solid earth. This new knowledge may answer such questions as these:

How can the harmful effects of ozone (occurring at the fringe of outer space as well as in manufacturing operations) be countered more efficiently? How much will greater understanding of cosmic rays hundreds of miles above the earth contribute to radiobiology? What can the orthopedist and the neurologist learn about reflexes in a gravity-free state? How much can the internist benefit from the knowledge of organic functioning during prolonged periods of weightlessness? How many ground-based mental health problems can be solved from the experiences of confined men who spend dayless and nightless time in an inky void which is pierced by a searchlight sun and the bluish glow of once-secure earth?

Man Independent of Earth

An even more intriguing question—can man sustain himself independently of this planet?—is being pursued diligently around that "space cabin" at Randolph. Volunteers have spent as long as 24 hours in the 96-cu. ft. sealed tank. Recently it has been instrumented to automatically control oxygen intake, carbon dioxide absorption, temperature, and humidity. The ultimate goal is to recycle wastes into essentials, in order to support human life over a prolonged period.

Already, the cylindrical cabin's urine distillation apparatus produces water that is more potable than many municipal drinking supplies. In a refined space cabin, nitrogen collected in the distillation process would help nourish algae, which, in turn, could absorb all the occupant's carbon dioxide while supplying him the needed oxygen. The growing algae (a mere 5 lb. of one variety is described as an adequate gas exchanger for one man under ideal conditions) might supply part of his food. Promising experiments now are under way to grow similarly valuable algae from human feces.

And if that space ship of the future should embark on a two-year round trip to Mars, the doctors at Randolph Field will have a pretty good advance understanding about potential food among plant life on that planet. Their deductions on Martian biology have been supported only in recent weeks. It is one of the most amazing findings to come out of an American laboratory.

Mars in Jars

Last fall, soil samples containing the approximate iron content indicated in telespectrographic studies of Mars were placed in bell jars and subjected to just about all the conditions believed to exist on Mars. These included a Mars atmosphere containing one-twentieth the oxygen of earth's, an extreme dryness not known naturally on this planet, and one-tenth the earth's atmospheric pressure. The jars were moved back and forth from room temperature to freezers at 30 degrees below zero during the simulated Mars days of 25 hours, 37 minutes, and 22.6 seconds.

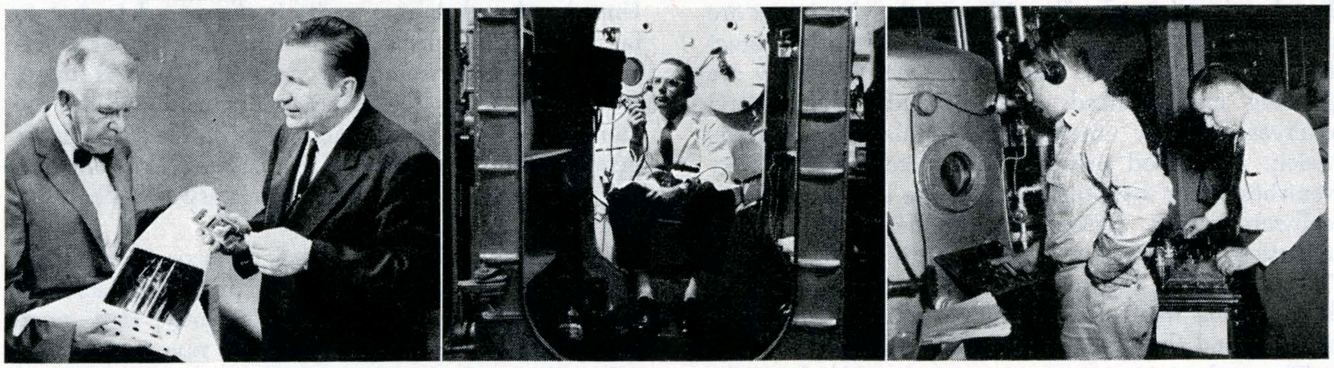
Now the School of Aviation Medicine is able to report that micro-organisms placed in some of these bell jars at the start of the continuing experiment have managed to survive under conditions which would quickly kill any amebas. It tends to bear out a theory that the bluish-green splotches along Mars' "canals" are forms of simple plant life. Not surprisingly, the micro-organisms in those "Mars jars" are bluish-green.

Such advancements in the Air Force laboratory do not just happen: they are fruits of the same kind of dogged diligence that doctors have shown along with other men interested in flight. Medical science's range of accomplishment toward physiological safety in upper air extends from the first balloon flight across the English channel in 1795 to the sharp deceleration from 632 miles an hour only two years ago. An American physician, Dr. John Jeffries, was co-pilot of the balloon flight. Another physician, Lieut. Col. John Paul Stapp of Holloman Air Force Base, N. Mex., risked his life with the one-second-plus stop in a rocket-powered sled. (He said: "I felt like a fly riding the nose of a .45-caliber bullet.")

Animals and Day-Night Cycles

During the 160-year span of those two events, doctors have been "on the ground floor" of aviation research. They were among the French scientists who sent a hen, a duck, and a goat up in a balloon 8,000 ft. to test animal durability at great heights. (When only the hen appeared worse for wear on landing, they deduced that space was bad for chickens—until somebody found feathers in the goat's mouth.) Since then, physicians and allied scientists have sent up monkeys, mice, and dogs to much greater heights. Russian doctors claim the record safe altitude of 68 miles for a dog in a rocket last fall; the U. S. claims a record for monkeys and mice—80 miles up.

Experience with animals brought this evolutionary comment from Major Gen. Harry G. Armstrong when he started the space medicine department of



Left, model of five-place future rocket ship held by Dr. Hubertus Strughold, space medicine expert for the Air Force School of Aviation Medicine, is described by the craft's designer, Krafft A. Ehricke of Convair. *Center*, the school's sealed-cabin-simulator includes pneumograph, electrocardiograph, and thermocouples. Behind Dr. James G. Gaume in the photo is air lock for "shooting in" food. Under him is carbon dioxide absorber. Along wall at right is urine-distilling apparatus. Researchers hope to make this two-room "space suite" entirely self-sustaining for human life—with algae providing both food and a balanced oxygen and carbon dioxide interchange. *Right*, one Air Force physician uses intercom to check with man in the experimental space cabin while another doctor checks automatic controls. (Right-hand photograph, Air Force; others from North American Aviation, Inc.)

the Air Force School of Aviation Medicine several years ago: "If monkeys can do it, we can learn to do it."

Birds, too, have played roles in aviation medicine. Several years ago two well-loved pelicans died in a London park and were replaced with a couple of birds sent by plane from Texas. But these pelicans were not nearly as frisky as the originals. It so happened that Dr. Hubertus Strughold heard about it on a radio newscast. He is the German-born physician-naturalist-physiologist (an American citizen since last July) who heads the space medicine department at Randolph.

Dr. Strughold immediately informed the London zookeeper that the Texas pelicans probably were still adapting themselves to a new "physiological day-night cycle" after their long-distance flight. Within a week or so, he assured the zookeeper, the birds would perk up in readjustment. And they did.

Dr. Strughold likes to tell about the pelicans to illustrate the importance of day-night cycles in both global and space travel. As we approach flight at the speed of day (1,038 mph at the equator), we can leave Paris at local lunch time and arrive in New York at local lunch time. But the body says it is evening, and time for dinner. Unless an adjustment is made in eating and sleeping habits, physiological needs are thrown out of kilter. Over a prolonged period, says Dr. Strughold, it can lead to a nervous collapse. For this reason, the "space doctors" at Randolph are devising "days" of from 18 to 28 hours for future space ship crews—setting specific periods for work, sleep, and recreation. Such a schedule is necessary because there are no references for day and night in space.

How to Lose Weight Quickly

You can lose more than sleep because of an airplane flight. You can lose weight—all of your weight. It is an alternatingly weird and enjoyable experience for some people, and a nauseating one for others. One physician reported: "Everything seemed delightful." An enlisted man wrote, after his first flight into weightlessness: "It seems odd but not distasteful to be relieved of the task of holding up your own body and move without any effort."

Thousands of paratroopers and a few airplane pilots experienced the phenomenon momentarily during World War II as they plunged downward (a falling object weighs nothing in the instant that air resistance gives it weight again). At Randolph, and at the Navy School of Aviation Medicine near Pensacola, Fla., jet planes flying in high-speed parabolic patterns have now created weightless periods of up to 47 seconds for the occupants. Faster planes now in production will be able to increase the duration to 90 seconds.

What happens is that centrifugal force in the special flight exactly cancels out the force of gravity while thrust counters air resistance. Loose objects float before the eyes of humans held fast with seat belts. Hand and arm movements function eerily without the weight of flesh and bones. There is no up or down except for visual impressions given by the horizon. This phase of aeromedical research has particular importance, because unless a space ship takes along its own "gravity" (one way might be through constant rotation) crew members will have to move about by hand rails, magnetic boots, or suction-cup shoes. Even in orbital speed below the fringe of outer space—for example, in the unmanned satellite to be launched in a few months—there is continual weightlessness.

Unless there is adequate conditioning, disorientation of crew members in such a gravity-free state can have grave implications. Vision, man's only organ for reference under these conditions, faces radical adjustment. Essential instruments, like radarscopes, may be hard to read and even harder to react upon during vital procedures. Human aiming mechanisms may go haywire.

Dr. H. J. A. von Beckh once tested the deadly accuracy of long-necked South American water turtles during gravity-free conditions. One was normal, while another had lost its labyrinth, which is the main organ of equilibrium for both turtles and man. During a dive of their fast plane, Dr. von Beckh poked bits of food in front of the turtles. The injured one, who already had adapted eye coordination on the ground, snapped at the morsels easily during weightless moments. The normal turtle overshot (as human aimers have also done in target tests)—but after several dozen flights it, too, was able to coordinate for efficient aim. (One annoying hazard of the experiment was that the water in the turtle tank also became weightless during the dives, so that often Dr. von Beckh found himself lifting the tank to fit it around the water again.)

Some years ago Dr. Strughold decided to test weightlessness on himself. Informed that pilots in those days flew "by the seat of their pants," he injected an anesthetic in each of his buttocks, and went up with a pilot in a two-seater plane. He says: "I felt absolutely nothing." Another researcher at the Air Force School of Aviation Medicine, Psychologist Siegfried Gerathewohl, once tried to photograph weight changes of a bottle of soft drink during a parabolic dive. To his surprise, the weighing platform holding the bottle lifted clear away from the scale.

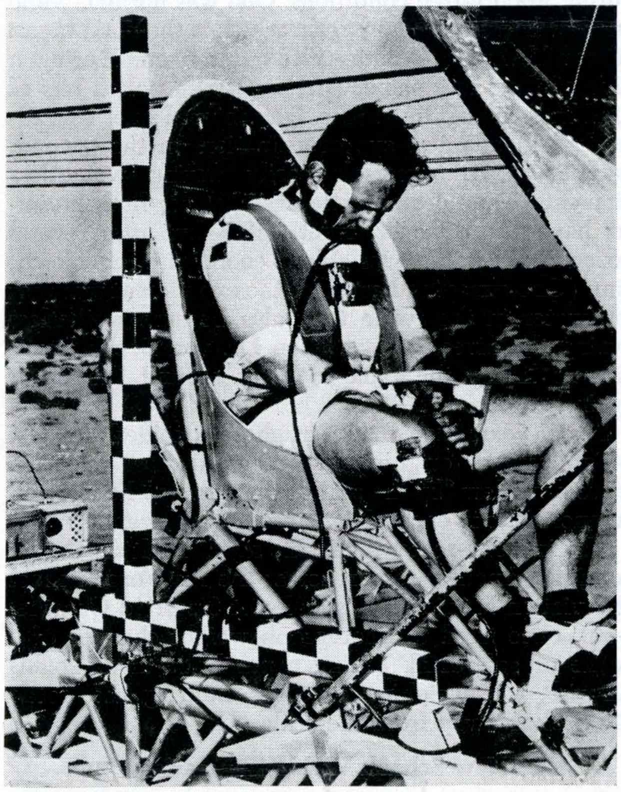
New School, Wide Cooperation

At last report, Dr. Gerathewohl and others at the school were planning to run a series of electrocardiograph studies on humans during states of weightlessness. In fact, many new studies in space medicine are being outlined now as construction work proceeds on the new School of Aviation Medicine at Brooks Air Force Base near San Antonio. Groundbreaking for the 9-million-dollar project began only last month, and in about two years some 2-million-dollars' worth of specially designed atmospheric pressure chambers will be functioning in an "altitude building" of the finished school. The installation will include refined versions of the simulated space cabin now at Randolph.

Advanced aeromedical research is going on also near Pensacola, Fla., where the Navy this spring formally commissioned its 18-year-old School of Aviation Medicine, its hospital, and parts of its dispensary into a combined Naval Aviation Medical Center. Other space medicine studies are going on in universities and aircraft plants, some under contract with the Navy or Air Force.

This year a Harvard-Guggenheim Center for Aviation Health and Safety begins operation to study human adaptation to extreme speeds, altitudes, temperatures, and toxic agents. A full course in aviation medicine, the only one of its kind in the U. S. for civilian as well as uniformed physicians, is being conducted at Ohio State University. A number of medical schools across the nation, including that of the University of California, recently have been offering short courses in aviation medicine, covering problems in interplanetary travel.

Problems in the physiology and psychology of space travel have been pursued for over a decade by the Douglas Aircraft company, Bell Aircraft, the Glen L.



Lieut. Col. John Paul Stapp, the Air Force physician, as his rocket-powered sled finished a deceleration from 632 mph in little more than one second. His volunteer effort to test the effects of high gravity forces on the human body has contributed to pilot safety during escape from aircraft at high speed.

Martin company, Convair, and other aircraft firms (Convair's division of astronautics has over 5,000 employees). Better than 60% of research and development work for the aero medical laboratory at Wright-Patterson Air Force Base, Ohio, is done by some 200 private agencies under contract. Litton Industries of Beverly Hills, Calif., this month is testing a high-vacuum laboratory in which space conditions can be simulated and humans might survive while wearing pressurized suits.

And when the Navy launches the first of six rocket-powered satellites from Florida in a few months, it will both culminate and spark a world-wide cooperative effort. Aircraft workers in Baltimore put the rocket together. Shells for the satellite are being assembled at a Detroit firm. Dozens of precision manufacturers in all parts of the country have been making parts for it. As soon as the 20-in.-diameter "moon" is blasted off, electronic and human reports on its path will be compiled by International Business Machines in a special building in Washington. Thousands of "moonwatchers" in nearly 60 nations, cooperating in the International Geophysical Year (actually 18 months) beginning July 1, will keep track of "the bird" as it loops along an oval orbit.

Although this space craft will not be manned, some scientists believe that its journey will provide enough material for evaluation on human space flight conditions to keep them figuring and consulting for the next 20 years.

Physician-Engineers

Not too many years ago, aircraft were being built without the benefit of medical consultation—until manufacturers discovered that occasionally they were producing models that could fly well but would not adequately protect the pilot. Now most large firms have medical advisors working with engineers and designers. One result is that many doctors in aviation medicine find themselves talking and thinking like aeronautical engineers.

These physicians with a common interest banded together 28 years ago when the Aero Medical Association was founded and first headed by Dr. Louis H. Bauer, past-president of the American Medical Association and now secretary-general of the World Medical Association. The Aero Medical Association has a membership of some 2,000 physicians and allied scientists, some of whom also belong to other organizations linked to health in the upper air. These include the six-year-old Space Medicine Association and the Civil Aviation Medical Association, now in its 11th year. Only recently, the American Rocket Society established a space medicine committee. A number of physicians are active in the American Astronautical Society. Membership and activity in all these groups is growing at a rapid pace.

Demand for authentic information on space medicine is so great that in a few weeks the first of a series of 13 filmed educational programs entitled "Doctors in Space" will be telecast for the profession and lay public. Air Force and Navy scientists will discuss lack of oxygen and pressure, intense heat and cold, cosmic and ultraviolet radiation, the question of life on other planets, and rocket ship design. These half-hour shows are financed by the Ford Foundation.

At the Aero Medical Association's annual meeting last month, upper altitude problems were known to be of such great interest that the entire session centered around a theme of "medicine in the jet-atomic age of flight," including current research in manned space satellites. To emphasize the cooperative effort, nearly 50 companies, ranging alphabetically from AiResearch Manufacturing to Wyeth Laboratories, are active as corporate members of the association. (The Aero Medical Association's new president is Navy Capt. Ashton Graybiel, the heart expert who directs aeromedical research at the Pensacola center. Other executives of the association include Air Force Surgeon General Ogle, and Major Gen. Otis O. Benson Jr., who heads the school at Randolph Air Force Base.)

Interrelationships

That all of organized medicine, in fact, is concerned with aeromedical problems is shown by American Medical Association actions which recognized aviation medicine as a separate specialty in 1953; scheduled a joint meeting in New York City this month with the Aero Medical Association to hear and discuss a paper on "Problems of Spatial Disorientation"; and (at the request of the U. S. Commerce Department) named a study committee this spring to make recommendations on medical problems in aviation.

But it has not always been smooth flying for the air doctors. The first surgeon general of the Air Force, Major Gen. Malcolm Grow, had to fight all the way for support, funds, and even recognition within the military service and the medical profession. Many physicians and Army officers felt that aviation and medicine had nothing in common. "We were thought a lot of crazy guys with our heads in the clouds," Dr. Grow recalled recently.

Now, cooperation—involving organized medicine, industry, the armed forces, foundations, and educational institutions—is mutually regarded as essential to assure human safety in a region which has always been a no-man's land. One reason is that every problem in space medicine touches upon some nonmedical field: psychology, astrophysics, biochemistry, engineering, biology. Navy medical officers decide they need a "space suit" that will protect a pilot for hours in a near vacuum; they develop one with the support of the Air Force and the Douglas Aircraft company. Air Force doctors say they want a different kind of suit for high-altitude flight; theirs is designed with the help of corset manufacturers.

Problems

But as some problems are scratched off, others loom into view: How can men adapt naturally to higher and higher altitudes? (The U. S. Air Force financed a study of Peruvians living at 16,000 ft. to help find out.) What can safely stop a man from spinning as rapidly as 200 rpm as he escapes from a disabled plane at very high altitude? What can be done to counteract "empty field myopia," the nearsightedness which is expected to attack even normal eyes in space, where there is no reference point for focus? Is it possible to develop a safe drug which will bring back pilots who have suffered otherwise-fatal exhaustion in space flight? How can we accurately measure in advance the possible genetic hazards of space travel as the result of increased cosmic-ray bombardments? (The Navy's aeromedical experts warn that commercial airliners should not risk flight above 90,000 ft. until it can be shown there is no such danger.) What can be done to reduce the physiological damage caused by a rocket ship's intense noise during takeoff—and to solve the psychological problem of extended deathly silence afterward?

Equally tough are problems of aerodynamic heating, diet, communication, equilibrium, and breathing. (Unless the space-crew member is in a sealed cabin he must breathe oxygen under pressure, which requires a positive exertion to exhale.) One of the most important problems is psychological. Can man stand the pace, the prolonged confinement, the insecurity and loneliness, the monotony—the total emotional and mental stress—of space travel? Recent tests show that, even with special drugs, Air Force crews in unrelieved confinement begin seeing little men in their cockpit dials after 30 sleepless hours.

But at the rate all branches of medicine are advancing, none of these problems is insoluble, according to Air Surgeon General Ogle. He says: "I could remain entirely within the realm of reality by predicting that we may in the near future be able to select and adapt human beings for specialized environmental circumstances by blood studies and adjustment of various steroids, hormones, and enzymes; by urine studies to determine the adrenal gland activity; by galvanic sensitivity tests of the skin to determine the threshold of central nervous system awareness; by determination and adjustment of metabolic processes; and by brain studies through selected area electroencephalography."

Bright Future

Meanwhile, no medical problem is slowing down developments toward sustained flight beyond our atmosphere. A University of California physiologist, Dr. Nello Pace, told a symposium last year that man will be ready for space travel as soon as space ships are ready. And that will be sooner than many people suspect.

Already, North American Aviation, Inc., has begun fabrication on the X-15 rocket research plane, which reportedly will be able to reach a speed of 4,000 mph at an altitude of 264,000 ft. There have been hints of an even faster, higher-flying craft, the X-30. Aeromedical experts calculate that the human body under certain conditions can tolerate the gravity forces which a rocket ship would exert in bringing a man to a speed of 25,000 mph within eight minutes. A considerably smaller force would be needed to shoot a rocket airliner 100 miles up in a 25-minute flight from New York to San Francisco. When will that be? "In the next 5 to 10 years," replies Dr. Strughold, the Air Force's space medicine expert.

Such predictions of travel through the black screen of space (except for a piercing sun ball, blacker than any moonless night on earth) are part and parcel of aeromedical research, because they have their origin in laboratories, high-flying jet and rocket planes, and animal-carrying rockets. They have their optimism in the progress of colleagues in all branches of medicine. And they have their support in the liaison with many nonmedical groups and individuals working to pierce man's last natural frontier.

If the aeromedical men occasionally seem to be spouting the phrases of dreamers, that, too, is to their credit. For research needs more physicians who can extend their large body of knowledge into the untried, the unconventional, and the unknown. Research needs more men like the doctor in Alaska who "dreamed up" a lifesaving oxygen tent out of a casket case.

Thooris, Bauer, and Kretschmer. The results of their endeavors up to 1927 were summarized by Weidenreich.[4] He dealt at length with their imposing vocabulary of words like dolichocephalic, brachycephalic, macrosplanchnic, microsplanchnic, respiratory, digestive, muscular, cerebral, leptosomic, asthenic, pyknic, leptoprosopic, euryoprosopic, leptosomatic, euryosomatic, and euryosomic, not forgetting the Japanese *choshiu* and *satsuma* types. He came to the conclusion that these types occur in all races. The words do not correspond to any primitive dichotomy of mankind, and their use in discussions of physical constitution is simply a matter of convention.

Since that time, however, a more intricate vocabulary has been developed, and the literature of the subject now abounds in allusions to linear and longitudinal types, ectopenes and mesomorphs, tamanoirs and tamanduas,[5] the A-type of Curry and the K-type of Lampert, the S-type and V-type of Hauswirth,[6] and most recently the gothic, baroque, and renaissance types of Kralj-Čerček.[7]

An attempt to make practical application of this sort of information is made by Franke,[6] from whose paper the following paragraph is translated and condensed:

> The A-type (Lampert) or K-type (Curry), being of predominantly asthenic, leptosomic body-build, has a parasympathetic-alkalotically oriented metabolism and therefore needs a diet with emphasis on the acid valences. . . . In general he does not react well to prolonged periods of raw foods or fasting. On the other hand, the B-type, or the heat-sensitive W-type (Curry), being usually of the pyknic type, and having an ergotropicacidotically oriented metabolism, needs a more basic diet.

Relying on Sheldon's statement that "the pyknic individual is a fat man, or woman," the above can be translated to mean that fat people can fast longer than thin people, which is undeniable, and that reducing diets should emphasize alkaline residues, which is controvertible. As for the K-type, De Rudder[8] suggests that it be interred quietly along with the now-forgotten Aran-hypothesis in which Curry tried to explain so much of human disease by variations in the concentration of allotropic forms of oxygen in the atmosphere.

A number of other facts justify the suspicion that the whole subject of physical typing is based on confused thinking, loaded with unproved statements, padded with irrelevancies, and marred by fallacies. The confused thinking is exemplified in the concept of the ectomorph as a person in whom the derivatives of the ectoderm (skin and nervous system) predominate, for there is no indication in the "Atlas of Men"[5] that the men who rate 7 (highest) on the scale of ectomorphy are distinguished by outsized brains, overdeveloped spinal cords, or redundant epidermis. The unproved statements in the older literature on the subject have been adequately quoted and criticized by Weidenreich; in the newer literature they are well exemplified by the observation, in a recent textbook, that the gastrointestinal tract of a person of the pyknic type usually manifests "marked tone and motility made possible by the spaciousness of the abdomen." The irrelevancies are the allusions to leopards, walruses, anteaters, and dugongs in the current literature on somatotyping. The fallacies are exemplified by the recent report that girls of the baroque type on the island of Sosak experience the menarche 0.9 years earlier than do girls of the gothic type; girls broaden, just as boys exhibit a darkening of the hair, during adolescence.

The physician finds it hard to suppress a feeling of resentment when he finds, or suspects, that he is being imposed upon by a bombastic or obscurantist vocabulary. Why describe a person as pyknic, euryosomic, euryoprosopic, macrosplanchnic, digestive, lateral, endomorphic, or baroque, when he might as well be described as stout, stocky, broad, or fat? In the words of one skeptical reviewer,[9] "And the indices of body build; just exactly what do they tell once they have been computed?"

ROCKETING RISE OF SPACE MEDICINE

Time no longer merely flies: it is rocketing faster than the twirling globe itself. The International Geophysical Year begins July 1, and a few months later a basketball-sized "little moon" will be flung out into virtual nothingness—an earth-girdling scout for scientific fruitfulness. Already a pilot has gone 24 miles up—virtual outer space where there is a scant one-third of one per cent of sea level air. And by about 1965, according to a foremost authority in space medicine, airline passengers will whiz 100 miles skyward in a 25-minute flight from New York to San Francisco, seeing the sun set in the east en route.

If anyone thinks that all this supersonic speed on high is leaving medicine agape at the local bus stop, he need only watch the work of Air Force doctors in Texas, Navy physicians in Florida, and medical researchers in California aircraft plants. They are not only reading, but also writing, science nonfiction—ripping fantasy from fact, uncovering facts that may seem fantastic. They are getting ready to treat human ailments that have not yet occurred anywhere in the world, because patients soon may be returnees from out of this world.

Here is a new frontier. And the "space doctors," individually and through their associations, are attracting more and more colleagues into this field. At the same time, they hope to alert the entire profession to their own studies, which promise to benefit everyday practice in all branches of medicine. The story of this upward-look-with-feet-on-ground, via close liaison with lay individuals and agencies, is told in a Medicine at Work article, "Health in the Heavens," starting on page 765.

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