MEDICINE

Muscle Disease Victim Allergic to Himself

➤ THE PERSON suffering from the progressive, muscle-weakening disease, myasthenia gravis, may be allergic to himself.

In a report to the Conference on Myasthenia Gravis in New York, Dr. William Damashek of the New England Center Hospital, Boston, noted that some abnormal cells may hold the clue to autoimmunity in the myasthenia gravis victim.

These abnormal, small, connective tissue cells found in the lymph nodes, spleen and tonsils may have come from a single abnormal cell that passed from mother to baby before birth, Dr. Damashek said. Chemicals, viruses or some types of radiation might also have produced them.

When the body's antigens come in contact with the abnormal cells, they act as if the cells were foreign invaders. The cells respond as if to defend against an invader.

Normally, when a foreign substance enters the body, the production of antibodies by the antigens protects the person against disease.

However, in this case, where the body's reaction to abnormal cells is the same as it is to a foreign substance, the antibodies only succeed in making the person allergic to his own antigens.

During the course of myasthenia gravis, the thymus, a lymph gland located beneath the breastbone, develops clumps of these abnormal cells. Similar clumps also develop when antigens are injected into the thymus.

This seems to indicate that antigens from the myasthenia gravis patient are either in the thymus, or enter it to start the reaction, the researchers pointed out.

Myasthenia gravis victims have extreme muscular weakness. The muscles of the face, lips, tongue, throat and neck are especially affected, causing such distortion as double vision, drooping eyelids and toneless voices.

• Science News Letter, 87:104 February 13, 1965

METEOROLOGY

Wave Pattern Influences East Coast Weather

➤ THE WAVE PATTERN resulting from air flowing over the Allegheny Mountains greatly influences the weather in the valleys of the eastern United States.

Studies of these wave patterns by three Pennsylvania State University meteorologists are actually part of the Administration's war on poverty in Appalachia. Rainfall is essential to growing crops, and much rain that might fall evaporates in winds to the leeward of the low mountains in the central Appalachians.

How the air flows over the mountains holds clues to drought hitting the eastern states, Dr. Charles L. Hosler and two graduate assistants, D. Ray Booker and Larry G. Davis, have found. They used radar-tracked superpressure balloons and aircraft instruments to detect the air flow.

Mr. Booker told the American Meteorological Society meeting in New York City. that the waves are formed when the air flows up over the mountain ridges and dips downward on their lee sides into the valleys. They are called lee waves.

Rain falls when moisture-laden air is rising. When air sinks, clouds break up and rain does not fall. Clouds that form on mountain ridges often break up as they drop on the lee side.

The Pennsylvania State University scientists hope to learn how to prevent the breakup of these lee waves.

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OCEANOGRAPHY

Undersea Canyon Probed by New Ship

➤ A SHADOWY SEA CANYON 80 fathoms beneath the Atlantic Ocean is being explored for the first time in history by a new oceanographic research ship.

The Hatteras submarine canyon, a deep gash in the bottom of the sea that starts about 28.5 miles due east of Cape Hatteras and runs southeast into the deep Atlantic, is being explored with sonar soundings from the vessel Eastward, in operation for the Duke University Marine Laboratory, Beaufort, N. C.

The canyon is 500 feet deep and a mile and a half wide at its western end, Duke University scientists have found. In the next nine miles, it spreads out to three miles wide, and scientists believe it will get deeper as it runs down the continental slope into the continental rise and finally to the Hatteras abyssal plain.

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TECHNOLOGY

New Twist on Old Theme: Tires Hard on Pavement

➤ INSTEAD OF determining how fast a roadway wears down a set of tires, two engineers have looked at the other side of the story, and have found that a new kind of tire is taking quite a toll of the road.

Single "wide-base" tires that are replacing the conventional double-wheel side-by-side arrangement found on many large trucks, have a considerably greater destructive effect on asphalt pavement. A load of 12,000 pounds per axle in a truck equipped with wide-base, or flotation, tires does as much damage as 18,000 pounds per axle in a dual-wheeled vehicle.

The comparative strain caused by the wide-base tires varies with the temperature of the pavement, said Ernest Zube and R. A. Forsyth of the California Division of Highways. At temperatures above 80 degrees Fahrenheit the effect, compared with dual wheels, is even greater. Below 80 degrees the effect diminishes.

The research, reported at the 44th annual meeting of the Highway Research Board in Washington, D.C., was carried on at eight different cities, using two trucks with single rear axles. The study revealed that deflection of the pavement decreased 10% when the air pressure in the tires was reduced from 75 to 55 pounds per square inch.

• Science News Letter, 87:104 February 13, 1965

IN SCIEN

BIOTECHNOLOGY

Seasickness Experiment Tests Sonar Operators

➤ A "LAB-LOCKED sea horse" that simulates the roll of the ocean to the point of inducing seasickness is in use by the Navy. The device, designed and built by the Boeing Company, Seattle, is helping determine if the motion of a ship at sea can significantly affect the performance of sonar equipment operators.

The equipment, which has brought on seasickness in test volunteers, consists of a black canopy-enclosed operator's station on wheels mounted atop an arched 20-foot runway.

During the test, this station rolls from side to side over the runway while, at the same time, the entire runway structure rises and falls along a ten-foot vertical track.

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SURGERY

New Techniques May Cut Leg Amputations

➤ LEG AMPUTATIONS have been avoided by using two new techniques to unite a shin bone fracture that previously would not heal because of infection.

In a report to the American Academy of Orthopaedic Surgeons meeting in New York, Drs. Paul E. McMaster and Mason Hohl of Beverly Hills, Calif., outlined a "cross-peg" grafting technique that avoids the infected area by diverting the weight of standing and walking from the shin bone, or tibia, to the slender fibula, which runs parallel to it.

An internal splint is provided after eight square pegs of bank bone are wedged between the fibula and the tibia near the area that would not heal.

This splint holds the fragments of the shin bone in place, thus helping to control infection as well as aiding in the union of the fracture.

The doctors report that 14 of the 18 patients treated can now walk without support.

Another technique that has averted loss of a leg was described to the meeting by Drs. LeRoy W. Hanson and Richard H. Eppright of the Veterans Administration Hospital and the Jefferson Davis Hospital in Houston.

Using this procedure, a bony bridge is placed across the back of the fracture site on the tibia where the area is free of infection and drainage.

When the bone begins to unite, the infection generally becomes easier to manage, the doctors said.

They found this type of bone graft to be successful in returning use of the leg in 22 of 26 cases treated.

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CE FIELDS

RADIO ASTRONOMY

New Class of Radio 'Star' Found in Distant Galaxy

➤ UNEXPECTEDLY STRONG radio signals received here on earth have announced to astronomers a hitherto unknown kind of "star."

The new class of radio star was discovered in a far-away galaxy known as NGC-1275. The strange source could be related to the recently discovered quasars, which are the most powerful and mysterious sources of radiation known.

The intense radio emission from NGC-1275 was detected by Fred T. Haddock and W. A. Dent of the University of Michigan Radio Astronomy Observatory, Ann Arbor, Mich. Following the discovery of NGC-1275, the scientists found another object, called 3C-279, with a similarly intense radio emission.

One explanation for the great flood of radio waves is that a mass equal to that of 40 billion suns has been ionized by some unknown mechanism. This could account for the observed pattern of radio emission, Mr. Haddock told SCIENCE SERVICE.

The new radio "star" could be either a quasar being born or one in its death throes. NGC-1275 is one of an unusual group of objects called Seyfert galaxies, after the astronomer who first classified them. It is one of the few Seyfert galaxies sending out radio waves.

Mr. Haddock and Mr. Dent reported details on their discovery in Nature, 205:487, 1965. Their discovery was confirmed by J. W. M. Baars, P. G. Mezger and H. Wendker of the National Radio Astronomy Observatory, Green Bank, West Va., whose report was made also in Nature, 205:488, 1965.

• Science News Letter, 87:105 February 13, 1965

GENERAL SCIENCE

Johnson Administration Budget Science Oriented

➤ THE SCIENCE orientation of the Johnson Administration is increasingly apparent through analysis of the proposed $99.7 billion Federal budget for the next fiscal year.

From space travel to high-speed surface travel, education to public health, matters pertaining directly or indirectly to technological and scientific development are set to receive a heavy share of the tax dollar.

The space program calls for an outlay of $6.9 billion, with major emphasis to be placed on a scientific search for life on Mars. The total is $230 million greater than current space expenditures.

By contrast, the budget for the Atomic Energy Commission is $170 million less than the current year's figure. The cut is primarily reflected in reductions in expenditures for raw materials, weapons and atomic test programs.

The President's previously expressed keen interest in rapid transit rail commuter service was reflected in a $20 million allocation for tests of prototype new cars and further research.

A hint was given that the controversial supersonic transport program would be decided in the near future. The budget calls for $400 million to be set aside for the plane and certain other expenditures in the event it was decided to push forward with the project. The President promised a speedy decision in his message.

The National Science Foundation is in line for new obligational authority of $530 million, up $110 million over the current year. The President's message stated that, "With the tapering off of growth in research support from other agencies, increased reliance must be placed on the Foundation in 1966 to underwrite the nation's basic scientific research, particularly at universities."

The budget further stated that expenditures for the Foundation's programs are estimated to rise by $80 million to a level of $405 million.

Overall, the budget provides for a 63% increase over 1965 to accelerate progress in education at all levels.

In the field of health services and research, the Department of Health, Education, and Welfare will spend an estimated $2.2 billion for health research, training, public health services and related consumer protection activities.

• Science News Letter, 87:105 February 13, 1965

TECHNOLOGY

Gas Mileage Measured By Photoelectric Cells

➤ PHOTOELECTRIC cells are the heart of a new super-accurate gas gauge that is helping testers measure automobile fuel consumption to within a thousandth of a gallon.

Information from the gauge, however, will be helping to improve highways, not cars. Fuel consumption, the largest single operating expense of an automobile, is also the most sensitive to highway conditions, said Joseph Michalowicz, head of the electrical engineering department of Catholic University, Washington, D.C.

Hills, curves, speed limits and type of pavement all affect fuel economy, said Mr. Michalowicz, and highway designers have been hampered by the lack of a suitable fuel consumption meter.

The new meter works by measuring the amount of fuel passing through three glass tubes connected with the carburetor.

Photoelectric cells give accurate measurement of each five cubic centimeters of fuel as it is used by sensing the position of a series of opaque floats bobbing along the tubes.

Mr. Michalowicz told the 44th annual meeting of the Highway Research Board that the gauge is not affected by vehicle movements such as starting, stopping, hill-climbing and going around sharp curves.

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METEOROLOGY

Nation's Capital Has World Weather Center

➤ THE FIRST of three world weather centers has started operation in Washington. The others will be set up in Moscow and at Melbourne, Australia.

The center, under the direction of Dr. George P. Cressman, will gather weather observations and prepare forecasts for as much of the world as possible. The new direct weather communications link between Moscow and Washington will be used by meteorologists at the center.

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METEOROLOGY

Balloons and Satellites Could Track Weather

➤ IF INTERNATIONAL territorial questions can be solved, there should be no problem in observing the world's weather using some 10,000 balloons tracked from a satellite.

Calculations have shown the balloons would not collect in a cluster, as some had thought, Dr. Fedor Mesinger of Yugoslavia's University of Belgrade reported in New York.

He told the American Meteorological Society meeting that his calculations had shown the balloons would have a random, or unpatterned, distribution even after circling the earth for a long time.

The experimental calculations were made at the National Center for Atmospheric Research, Boulder, Colo., by Dr. Mesinger. He used a mathematical model in which 2,000 balloons were floated at five different levels from 5,000 to 40,000 feet to simulate what would happen in the atmosphere.

The constant-level balloons would be, in effect, satellites of satellites, since information from them would be collected by orbiting observatories, then telemetered to earth.

The international problems arise because the balloons would cross national territories.

Various plans to launch balloons and investigations of the hazards they might be to aircraft are now underway. The international World Meteorological Organization is pursuing similar studies.

• Science News Letter, 87:105 February 13, 1965

PUBLIC SAFETY

Accidents Up for Third Straight Year of Increase

➤ ACCIDENTS claimed 106,000 lives in 1964—the third successive year in which an increase has been recorded.

Five thousand more Americans were killed in 1964 than in 1963, putting the accident death rate at its highest level since 1957, 55 per 100,000 population.

Motor vehicle accidents, which rose by 4,000 last year, were the major factor in the upswing, Metropolitan Life Insurance Company statisticians in New York City reported.

• Science News Letter, 87:105 February 13, 1965