PHYSIOLOGY

Muscle Fiber Discovery May Produce New Theory

THE WHOLE theory of muscular development may be revised as a result of the discovery of Dr. D. D. Dasen, department of oceanography, Liverpool University.

It has been assumed heretofore that muscle fibers once formed from the embryonic cells will grow to various sizes but will not give rise to new fibers. But Dr. Dasen has found that some muscle fibers do increase in numbers, and he believes this may affect the whole theory of muscular development.

Dr. Dasen has made his observations on the eye muscle of the plaice, a fish of the flounder tribe. He has found that while the number of fibers composing this muscle remains nearly constant until the fish reaches a length of about three inches, it increases suddenly in specimens about four inches long. This he concludes, is evidence that muscle grows not only by a thickening of the component fibers, as happens in the early stage of the plaice, but also by a multiplication of the fibers, as happens later in the same animals.

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ENGINEERING

Army Being Motorized But Infantry Still to Walk

AUTOMOBILES are providing the solution to many of the military problems of today. The adaptation of motor vehicles to the ordnance requirements of the cavalry and infantry was described by Maj. H. A. Nisley of the Ordnance Department to the Society of Automotive Engineers.

Maj. Nisley explained that the idea of having every soldier ride into battle in an armored car had been abandoned. Most of the infantry will still have to tramp through mud. It was being realized that the cavalry, the reconnaissance branch of the army, must be the first to be equipped with the speed and protection of light armored motor vehicles.

Heavy and slower tanks which grew out of the 1917 introduction of armored tractors are to be assigned to infantry.

For reconnaissance and light combat purposes two types of light armored cars are being developed. The former is designed as a strictly private vehicle and the armored hull serves as the chassis. The second type, called combat cars, are used by the cavalry for assault purposes in much the same way that tanks are used by the infantry.

Maj. Nisley expressed the hope that tractor manufacturers would be able to speed up the present tractors and adapt them to military requirements. Army requirements are changing so rapidly that it would be impossible to keep up a complete modern fleet of combat vehicles without entailing an enormous expense.

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MICROCLIMATOLOGY

Trees Help Make Climate For Insects

WHETHER or not insect pests will infest a certain species of tree is determined not only by their liking for its foliage or fruit but also by the kind of climatic welcome it offers them. For trees make little climates within their leafy shells, different in humidity and possibly in temperature and other factors from the general atmosphere and from "micro-climates" of other trees.

Dr. H. H. Darby of the Bartol Research Foundation, Swarthmore, Pa., has observed a difference in the preferences of the Mexican fruit fly in Mexico during the hot season. The insects by preference take shelter under the thick foliage of mango trees, and avoid the more open, airier crowns of the sweet limes. The chief insect parasite of the fruit fly also showed a differential behavior along the same lines.

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SEISMOLOGY

China-Tibet Border Feels Severe Earthquake

CONSIDERABLE damage and loss of life was probably inflicted upon the region of the city of Chengtu in the Chinese province of Zechwan near the eastern boundary of Tibet by an earthquake early Friday morning (Aug. 25) which was recorded on the seismographs of the world.

Although it will probably be days or even weeks before news direct from the shaken zone reaches telegraph lines, the center of the earthquake and its severity was determined by the U. S. Coast and Geodetic Survey using data wired Science Service by leading earthquake observatories. The approximate epicenter was 31½ degrees North latitude and 102 degrees East longitude.

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IN SCIEN

PLANT PHYSIOLOGY

Hydrocyanic Acid Generated By Mushrooms

HYDROCYANIC acid, deadliest of all simple chemical compounds, is formed in the caps of two species of mushrooms, it has been discovered by M. Mirande, a French scientist. The poison was found in the gills of a small mushroom belonging to the genus *Marasmius;* it is extractable in cold water from both fresh and dried material, though neither the spores nor the underground root-like threads of the mushroom contain it.

The second hydrocyanic-acid yielding mushroom belongs to the genus *Clitocybe*: the poisonous night-shining American species known as the "jack-o'-lantern mushroom" is also a member of this group. This mushroom, unlike the *Marasmius* species, gives up its poison only when heated.

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ENGINEERING

Emergency Brakes Declared Misnamed

EMERGENCY brake is the wrong name for the auxiliary hand brake of automobiles, was the statement made by B. B. Bachman of the Autocar Company in a report on brake design to the Society of Automotive Engineers.

The secondary brake was called the emergency brake because it was used frequently when the foot brakes failed in the early days of automobiles. Mr. Bachman pointed out that modern four wheel brakes were entirely sufficient to stop modern motor vehicles and that the emergency brake had been relegated to parking operations alone.

One reason why manufacturers have continued to equip cars with a secondary brake is the law in many states that requires two separate and independent sets of brakes. Automotive engineers are puzzling out means of obtaining more space for brakes on the wheels and feel that the elimination of the secondary brake would be an advantage.

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CE FIELDS

CHEMISTRY

Gas Is Called Most Humane War Weapon

GAS WARFARE is the most humane of the methods of warfare, stated Dr. Philip B. Matz of the U. S. Veterans' Administration, Washington, in a report to the American Medical Association. Dr. Matz explained his opinion of gas as a humane warfare method by pointing out that of 70,752 casualties as a result of gas in the American forces during the World War, only 200 died immediately.

He presented the results of a careful investigation of the clinical records of nearly 500 men gassed by various gases. Most serious after effects appeared in cases of gassing with phosgene. In this group of men a number of cases of nervous and mental ailments as well as lung diseases developed.

The gas was not directly responsible for the mental ailments, Dr. Matz explained. But its severe effect on the individual man, particularly the swelling of the lungs which interfered with breathing, provided the exciting factor in persons with a constitutional defect of brain and nervous system.

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BACTERIOLOGY

Bacteria React Queerly To Ultraviolet Radiation

ULTRAVIOLET raying is usually declared to be deadly to bacteria when cultures of the latter do not show an increase in their numbers. But sometimes the bacteria are not killed, only driven into freak growth types, Dr. Frederick L. Gates of Harvard University has stated in a report to *Science*.

Dr. Gates rayed cultures of the common colon bacillus with ultraviolet light of a wavelength known to be unfavorable to their growth. Some of the cells died immediately, others were apparently unaffected and continued to grow and divide normally. Between these two classes, however, was a zone of intermediate and very strange bacterial behavior. The cells continued to increase in length without dividing, until they were scores of times their normal length. Their thickness varied from normal to three times normal diameter. These filaments, in Dr. Gates' phrase, "looked like spaghetti."

These strange growths were actively motile, weaving about like worms or snakes, or boring through the fluid like living drills.

After from two to four hours, degenerative changes set in. The long filaments either went to pieces directly, or divided crosswise into many small cell-like units which then deteriorated. Sometimes the survival of the colony was brought about by small, bright cells that pinched off at the ends of the filaments, and proceeded to produce colonies of bacteria, while the rest of the growth went on to its destruction.

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PHYSIOLOGY

New Device Carries Sound To Deaf Through Bones

A SMALL-SIZED portable device that enables deaf persons to hear through bones of the head has been developed by Dr. Hugo Lieber of New York City.

The method of hearing employed, which is known as bone conduction, dispenses with the outer and middle ear as channels of sound, and instead carries vibrations of sound to the inner ear by way of teeth or head bones. The deaf composer Beethoven used the well-known principle when he placed a flat stick between his teeth and rested the tip of the stick on the piano in order to catch some sounds of his own music.

Efforts to produce a small device using this principle have met with the obstacle that small vibrators would "freeze" if sufficient power needed for hearing was transferred to them. Dr. Lieber's invention, he claims, has overcome this difficulty.

In the new oscillator, power has been increased and the converted sound vibrations are conveyed to the bones of the head by the housing of the oscillator instead of by a small disk.

"In this new vibrator," Dr. Lieber explained, "a small gap enabling the production of a large power is obtained by using a rigid diaphragm stiff enough to vibrate and yet prevent the freezing action. By its construction it enables transmission of the vibrations over the casing which encloses the oscillator."

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PHYSICS

New Relativity Theory Suggested For Blind

A BLIND man in a scientific laboratory might find it necessary to construct a special relativity theory to account for his aural observations.

He would have to learn to read his meters and instruments by ear, and Dr. Wm. Bender of the University of Chicago suggests, in a report to the Franklin Institute, Philadelphia, that his findings might not agree with known measurements that have been visually recorded. The measuring marks on the blind man's instruments would have to shout out their location, each mark using a different tone of voice. It is conceivable that with a little practice the blind scientist might achieve an accuracy as great as could be obtained by visual means.

Dr. Bender is in doubt whether there would be agreement between measurements of the velocity of sound taken by the two methods. Only an actual experiment can decide this question. To account for any difference, a blind man's relativity theory would have to be constructed.

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ENGINEERING

Rubber Tires Show Advantages For Tractors

RUBBER tires on tractors have been shown to be more economical than the ordinary steel wheels by Prof. C. W. Smith of the University of Nebraska, who reported his findings to the Society of Automotive Engineers meeting in Chicago this week. (*SNL*, Oct. 29, '32, p. 257.) Savings in fuel and time were evident from the tests conducted by Prof. Smith. Tractors equipped with rubber tires often took a load in high gear that would almost necessitate low gear with the conventional steel wheels and lugs.

One of the features pointed out was the reduction in the tearing up of the soil and the consequent decrease in dust stirred up by the rubber tires. Prof. Smith thought that the rubber tires in addition to affording traction act like a spring, first absorbing energy and then feeding it out in an even way that more nearly utilizes the engine's full power than the rigid wheels and lugs will do.

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