SURGERY

Cut Nerves to Stop Pain in Neck and Head

➤ GOOD RESULTS with a nerve-cutting operation to relieve a certain kind of agonizing pain in the neck and back of the head are reported by Dr. William R. Chambers of Atlanta, Ga., in the *Journal of the American Medical Association* (May 29).

Abnormalities of bone and soft tissue about the junction of the spine and skull can cause this particular pain. Such abnormalities were found during operations in many more cases than would be expected, Dr. Chambers reports. Some of these had not been revealed, or at least not noticed, on X-ray examination.

The pain in the back of the head may be so agonizing and irritating as to make the patient highly nervous and even occasionally suicidal. Such patients are sometimes labeled psychoneurotic.

So far, 35 patients have been treated by the nerve-cutting operation. Dr. Chambers reports on 22 from whom he was able to get answers to a follow-up questionnaire sent three months to six and a half years after the operation.

Of the 22, good results were reported from 16, 10 of of whom reported complete relief. Of the six patients who had poor results, three reported some relief. These patients had all suffered from this particular kind of pain for years and many treatments had been tried without relieving the pain.

The operation is called posterior rhizotomy and consists in dividing the sensory spinal nerve roots high in the neck.

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METEOROLOGY

Long-Range Weather Forecasts by Computer

➤ LONG-RANGE WEATHER forecasts using giant "brains" were discussed privately by meteorologists attending a workshop on "Numerical Weather Prediction" in Washington.

Officially the workshop sessions were devoted to methods by which electronic computers can speed up and make more accurate 24- and 48-hour local weather predictions. Unofficially, however, the weathermen discussed the exciting prospect of five-day, or perhaps 30-day, forecasts with the aid of giant "brains."

Outlooks for weather 24 hours in the future, using the speedy mathematics of a computer, have already been made by Swedish scientists. (See SNL, April 10, p. 239.)

In the U. S., the Weather Bureau, Air Force and Navy on July 1 will start operating a joint unit to test weather forecasting by giant "brain" on a routine basis. (See SNL, April 3, p. 222.)

One reason for looking to five-day and longer forecasts is the time barrier. Gathering, plotting, analyzing and feeding the necessary information for a 24-hour forecast into a computer takes between 10 and 12 hours. Although the machine can then do its computations in less than an hour, getting the nation-wide weather picture to local forecasters requires still more time.

Finally, the local forecaster, using his specialized knowledge of his area's weather conditions, will make his prediction.

Speeding up the flow of information to the computer is also being considered. Some weathermen foresee the time when the required data on winds, temperatures and pressures will be automatically recorded, then relayed by radio directly to a computer for calculation of future weather. Such an "untouched by human hands" process is not for the near future, they warn.

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PSYCHIATRY

For Mental Health: Use These "Vitamins"

➤ PARENTS WHO want to help their children to good mental health will feed them "eight essential mental health vitamins," the National Association for Mental Health has reported. The eight are:

1) "Love: Every child needs to feel that his parents love, want and enjoy him; that he matters very much to someone; that there are people near him who care what happens to him.

2) "Acceptance: Every child needs to believe that his parents like him for himself, just the way he is; that they like him all the time, and not only when he acts according to their ideas of the way a child should act.

3) "Security: Every child needs to know that his parents will always be on hand, especially in times of crisis when he needs them most; that he belongs to a family or group; that there is a place where he fits in.

4) "Protection: Every child needs to feel that his parents will keep him safe from harm; that they will help him when he must face strange, unknown and frightening situations.

5) "Independence: Every child needs to know that his parents want him to grow up and that they encourage him to try new things; that they have confidence in him and his ability to do things for himself and by himself.

6) "Faith: Every child needs to have a set of moral standards to live by; a belief in the human values—kindness, courage, honesty, generosity and justice.

7) "Guidance: Every child needs to have friendly help in learning how to behave toward persons and things; grown-ups around him who show him by example how to get along with others.

8) "Control: Every child needs to know that there are limits to what he is permitted to do and that his parents will hold him to these limits; that though it is all right to feel jealous or angry, he will not be allowed to hurt himself or others when he has these feelings."

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IN SCIEN

MEDICINE

Modern Drugs Save TB Kidney Patients

➤ MODERN ANTI-TUBERCULOSIS medicines, such as streptomycin, isoniazid and PAS, are now saving three-fourths of patients with tuberculous kidneys who would otherwise die.

Figures showing this "great improvement in life expectancy" were reported by Dr. John K. Lattimer of Columbia Presbyterian Hospital, New York, at the meeting of the American Urological Association in New York.

At the end of five years, 92% of the treated group are alive, he reported, whereas only 19% of a similar group survived five years in the period just before the advent of modern chemotherapy.

"Better surgery is now possible on tuberculous kidneys with the help of chemotherapy," Dr. Lattimer said. "For instance, it is now safe to take out diseased segments of tuberculous kidneys, whereas in the past the entire kidney had to be removed."

Kidneys with widespread disease, however, are still best treated by complete removal, he stated.

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VOLCANOLOGY

Tiny Bubbles Cause Volcanic Eruptions

➤ EXPLOSIVE VOLCANIC eruptions are due to sporadic formation of groups of very tiny bubbles in molten lava. This is the theory advanced by Dr. George Kennedy, geophysicist of the University of California at Los Angeles.

The rapid propagation of gas bubbles in lava is similar to the very swift expansion typical of all explosions.

The traditional concept of explosive eruptions is that as lava solidifies around the chamber of the volcano, water is confined in an increasingly smaller area. When the pressure of the water becomes greater than that of the lava shell, an explosive eruption occurs.

This theory would account for only one explosive eruption, Dr. Kennedy pointed out, since once the shell explodes, the whole system is shattered. The new theory of bubble nucleation would allow for a series of violent explosions over an indefinite period.

Much of Dr. Kennedy's theory has been worked out in studies of critical bubble size in a beaker of water. By simulating some of the conditions in volcanic eruptions, he has been able to make a beaker of water "explode."

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CE FIELDS

MEDICINE

Severe Polio Leads To Other Severe Cases

➤ WHEN A first case of polio in a family is paralytic, other members of the family are more likely to get polio than when the first case is nonparalytic.

Also, when the first case in a family is paralytic, other cases that develop are more likely to be paralytic and severe enough to end in death. When the first case is nonparalytic, subsequent cases are also more likely to be nonparalytic and nonfatal.

Figures showing this are reported by Drs. Morris Siegel and Morris Greenberg of the State University of New York College of Medicine, New York, and the New York City Department of Health to the *Journal of the American Medical Association* (May 29).

The figures are from a study of 167 New York families in which more than one case of polio developed during the pre-gamma globulin period, 1949 to 1952 inclusive.

The findings show, among other things, that if gamma globulin is used to protect household contacts of a polio case, it is needed more when the first case is paralytic than when it is not.

When the initial case was nonparalytic, other cases in the same family were also nonparalytic in 73% of the instances, the New York doctors report. There were no deaths.

When the initial case was paralytic, subsequent cases were also paralytic in 70% of the cases and more than 13% of the subsequent cases ended fatally.

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BIOCHEMISTRY

Cancer May Have Own Chemical Profile

➤ CANCER TISSUE may have its own chemical element "profile" or pattern distinguishing it from the pattern of the host tissue in the body that it has attacked.

Cancer that has spread to the liver, for example, has only 18 parts per million of zinc compared to 80 p.p.m. in the uninvolved, or non-cancerous, part of the same liver. These figures are the average for four cancerous livers. By comparison, six non-cancerous livers averaged 37.7 p.p.m. of zinc.

The differences in the amount of this element in cancerous and normal livers were discovered by Drs. Kenneth B. Olson, George Heggen, Carl F. Edwards and L. Whittington Gorham of Albany Medical College, Albany, N. Y., and the Saratoga Springs Commission Research Laboratory, Saratoga Springs, N. Y.

Zinc is one of the "trace elements" that appears in very small amounts in the human body. Other elements of which there are only traces in the body include copper, manganese, silver, lead and cobalt.

Dr. Olson and his associates have developed a method, reported in *Science* (May 28), for detecting the quantities of 14 trace elements in body tissue, using spectrochemical methods.

They have so far studied the trace elements in the livers of six persons dying of non-cancerous disease, two dying of cancer of the esophagus and cirrhosis of the liver, four dying of gastrointestinal cancer spread to the liver, and one case of acute lymphatic leukemia with liver involvement. In the last case, iron, zinc, chromium and cobalt were significantly elevated.

The scientists are exploring the possibility of the existence of a trace element profile in cancer and host tissue, and also the possibility that the amounts of trace elements in blood plasma may give a clue to the amounts of these elements in the liver and other internal organs.

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TECHNOLOGY

Electronic "Brain" Aids Surgeon at Operations

➤ AN ELECTRONIC "brain" has been developed by scientists at the National Bureau of Standards to help surgeons and anesthetists at the operating table.

Instead of making computations from complex figures and formulas fed into it, this electronic computer picks up its own facts from the unconscious patient's body and relays them to the surgical team.

It is called the NBS Physiological Monitor. It continuously records blood pressure, pulse rate, pulse irregularity, breathing rate, and the volume of air exhaled per minute. This information is indicated in such a manner that the surgeon or the anesthesiologist can intepret the situation at a glance.

Safeguards are provided in the instrument to prevent incorrect information due to breakdown. It is so constructed as to permit its use with safety in an atmosphere of highly combustible anesthetic gases such as may be anticipated in the operating room.

The instrument was developed by Saul R. Gilford and Herbert P. Broida of the NBS staff. Financial support for its development was provided by Veterans Administration and the NBS Office of Basic Instrumentation, which is sponsored by the Office of Naval Research, the Office of Air Research and the Atomic Energy Commission.

The present model will be employed by Dr. Charles Coakley at George Washington University Hospital for further study in the operating room.

Later at the VA hospital in Richmond, Va., further studies will be conducted and an estimate made of its long range use and applicability, it was announced by Dr. George M. Lyon, assistant chief medical director for VA research and education.

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PHYSICS

Dry Ice Models Yield Missile Data

➤ SCIENTISTS AT the U. S. Naval Ordnance Laboratory, White Oak, Md., are using models of dry ice in their supersonic wind tunnel to find out more about meteors and guided missiles.

Dr. K. H. Gruenewald of the aeroballistic research department has checked drag and evaporation of the cold models under a supersonic blast. He found them suitable for special problems concerned with missile cooling. They also evaporate in a way similar to that by which meteorites burn as they plow through the upper atmosphere.

Checks on spheres made of the frozen carbon dioxide gas showed the drag coefficients were about the same as for non-evaporative models of the same shape. The dry ice spheres were checked at wind speeds of 1.86, 2.87 and 4.25 greater than the speed of sound.

The dry ice models are made from 50-pound blocks that have been sawed into small cubes. A blind hole is drilled in one side of the cube and threads are tapped with a tool that has been pre-cooled in liquid nitrogen or a mixutre of dry ice and alcohol.

The model is screwed onto a precooled plastic threaded rod that attaches to a lathe. The model then is turned down to proper size. Only one and a half minutes are required to make the model.

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HERPETOLOGY

Controlled Heating Helps Keep Snakes on View

➤ CONTROLLED FLOOR heating is being used in the new reptile house of Bronx Zoo, New York, to keep snakes near the spot where they can best be seen by the public.

Dr. James A. Oliver, curator of reptiles at the Zoo, suggested this trick of zoo showmanship: grade the panel heating so that at the front of the cages the snake can have the exact temperature it prefers.

Dr. Oliver believes that reptiles, like humans, will be healthier if the temperature is just right. So he has set the automatic heat controls of the radiant floor panels to the temperature now thought correct for each kind of snake. He will make studies, determine, to the degree, what is actually the temperature preferred by the snake.

To give the snake whatever color it was used to in its natural habitat, the cages are done in blues, greens, yellows, and pinks. Desert snakes get yellow; swamp snakes get green or blue.

Snakes that need drier air have infrared lamps in their cages, others get ultraviolet treatments if needed. The individual heating and ventilating system for each cage was worked out by Minneapolis-Honeywell engineers.

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