MATHEMATICS

Hitler Deserves Credit For New Abstract Journal

AMERICA is to furnish the world with a new international mathematical abstracting journal, *Mathematical Reviews,* to be born late this year or early next. Credit Herr Hitler and his Nazi ideas for this new venture, for there was in Germany a satisfactory abstract journal telling the mathematical world who had published what and where. But like all things German it was purified "racially." Foreign editors were dropped. Its internationalism sheared off. Taking easy access to literature away from a mathematician is like stealing a carpenter's hammer. So the godmothers of research, Carnegie Corporation and Rockefeller Foundation, hover over the new journal financially. The American Mathematical Society is managing things, the Mathematical Association of America assisting.

Science News Letter, September 9, 1939

PSYCHOLOGY

Single Punishment Changes All Later Behavior

PUNISHMENT does work.

Fresh evidence that the discredited spanking may be extremely effective for education is provided by rat experiments just reported by Dr. Warner Brown, of the University of California in the *Journal of Comparative Psychology.*

Rats were trained by Dr. Brown to turn in a food box so as to take the shorter of two paths, both leading to food. Invariably these trained rats took the quickest road to reward.

They had learned in the slow patient way of repeated experiences how to get pay with the least possible expenditure of effort.

But one punishment in this "short" food box changed their whole behavior. Instead of dashing at full speed down the short road and under the curtain that hid the boxes from sight, these punished rats became hesitant. Some vacillated between the long and the short paths. Nearly all those taking the short path paused timidly at the curtain. Some turned back there—almost at their goal.

At the "short" food box itself, suspicion and hesitation were marked. Necks were stretched out while the body was held back. Some turned back even there, going all the way to the "long" box where punishment had never been.

They had learned in one lesson.

Suspecting that possibly failure to receive food on the occasion of the punishment might be a factor in teaching the rats that their favorite "restaurant" had failed them, Dr. Brown had taken the precaution of first allowing the rats to be disappointed by failure to receive food. Unpunished, these rats continued to run to the short box. Later, punished, they hesitated or deserted it.

Punishment itself, Dr. Brown concludes, quite apart from failure to receive reward, has a positive and potent effect in altering all later behavior.

Thus Dr. Brown's findings discourage any tendency of psychologists to minimize the effects of punishment on the child.

But when psychiatrists deplore severe punishment, it is not because they believe it ineffectual. Like the psychologist, they have found that a single shock may change the whole life of the child.

Science News Letter, September 9, 1939

ASTRONOMY

Faint Dwarf Stars Fringe Great Galaxies of Stars

EVIDENCE that a typical disk-shaped island universe in far-off space probably has a preponderance of very faint dwarf stars at its fringes was presented to a special summer conference on astronomy at the Harvard Observatory.

The evidence results from measurements of the rotation of these nebulae made by Milton L. Humason at Mount Wilson Observatory which has been interpreted by Dr. Jan H. Oort, co-author of the Oort-Lindblad theory of galactic rotation which first gave astronomers definite proof that our own Milky Way galaxy turns in space like a giant-cartwheel.

He is now studying the more regular of the outside nebulae in an effort to learn about their structure and, if possible, the history and methods of their evolution. Later he will study the great swastika-shaped spiral nebulae which are believed to be similar to our own galaxy in an effort to learn facts concerning it which cannot be detected from our own position in one of them.

Preliminary results indicate that the light emanating from these nebulae is particularly intense at the center but that the mass is fairly evenly distributed. Dr. Oort has interpreted this as suggesting that the fringes of the system abound in very faint dwarf stars, or great amounts of gas, of considerable mass but low luminosity.

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IN SCIENC

GENERAL SCIENCE

Uncle Sam Is Storing Up Strategic Materials Stocks

QUITE the most self-contained nation on the earth, the United States is now storing up against an emergency the most essential of the "strategic" materials that would soon become scarce if we engage in war or war elsewhere in the world cuts us off from needed supplies.

Strategic materials are those, essential to national defense, that we would have to get outside continental U.S.A. in time of war. In the first days of an emergency, Uncle Sam would step in promptly to control and distribute them. They are:

Aluminum, antimony, chromium, coconut shell char, manganese of ferrograde, manila fiber, mica, nickel, optical glass, quartz crystal, quicksilver, quinine, rubber, silk, tin, tungsten, wool.

The government is now engaged in laying up what supplies it can of some of these materials, using $10,000,000 chiseled down from an authorized $100,000,000, made available in the closing weeks of the recent Congress. To buy all the stocks that might be considered desirable would cost about a billion dollars, it has been estimated.

Rubber is being obtained from Britain by swapping cotton for it, which saves a lot of cash expenditure.

Tin, and the metals used in tool steels, chromium, manganese, tungsten, are undoubtedly among the ones to be bought first.

While the monopoly metals, aluminum and nickel, are very necessary, commercial stocks are large in the case of aluminum and there is plenty of nickel just across the border in Canada.

Some of the "critical" materials, less seriously needed in an emergency, may also be purchased for stock-pile storing. This list includes: asbestos, cadmium, coffee, cork, cryolite, flaxseed, fluorspar, graphite, hides, iodine, kapok, nux vomica, opium, phenol, picric acid, platinum, scientific glass, tanning materials, titanium, toluol and vanadium.

Artificial substitutes, such as nylon and vinyon, for silk, and synthetic wool from milk's casein promise to help out greatly.

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E FIELDS

ARCHAEOLOGY

Gold Mask Portrays Royal Bible Villain

See Front Cover

MEET—on the front cover of this week's SCIENCE NEWS LETTER—a royal villain of the Bible—Pharaoh Shishak the First, who plundered Solomon's Temple in Jerusalem, carrying off to Egypt a rich haul of silver and gold. This gold mask of the King, and the coffins of silver and gold which provided him with a glittering burial, may reveal at last some of the lost Jewish religious treasures, melted and reshaped. Shishak's tomb was recently entered and pronounced undisturbed, by Prof. Pierre Montet of the University of Strasbourg.

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PSYCHOLOGY

Leadership Is Often Born Of Resentment of Authority

IN DEMOCRACY as well as in Reich, in the scientific world as well as in politics, men want and need leaders.

Yet most leaders are self-appointed. Their rise grows out of the compelling demands of their own personality rather than from any clamor of the populace.

Those resistless forces that put men above their fellows are analyzed by Lawrence K. Frank, of the Josiah Macy, Jr., Foundation for the scientific journal *Psychiatry*.

Leaders are of two types, Mr. Frank found. First there is the aggressive type who constantly strives to attract a following whose personalities he exploits. Coming from homes where discipline was strict and initiative and originality sternly suppressed, such persons develop leadership to express resentment of authority. Yet, once in power, they perpetuate the circle of overbearing authority and suppression of initiative.

"The universities and research institutes are everywhere caught in this personality difficulty," said Mr. Frank, "as distinguished men of science and the professions stand astride the road to new knowledge and improved methods, blocking, diverting and sometimes sabotaging the work that threatens to go beyond their own personal reach and convictions."

"The pronouncements of many of the authoritative states," he declared, "are no more absolutist and dictatorial than what many scientific and professional 'leaders' say or would like to say.

"The difference is in the permission still available here to reject these pronouncements if the rebel will take the risks involved of scientific or professional ruin."

But to another type of leader, authority and the accepted is neither to be resented nor worshipped but merely marks for him the frontier beyond which his own work must begin.

Such a leader, said Mr. Frank, "who does not need to destroy other persons or their ideas because his drive is to go beyond the accepted and familiar in creative endeavor, can achieve and then tolerate and even encourage successors who will explore ahead and often render his own work obsolete."

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GEOLOGY

No Heavenly Metal in Arizona's Meteor Crater

THERE'S no metal from heaven in evidence inside the huge meteor crater in Arizona. All metal must have spattered outside when the meteorite crashed to earth, says Samuel G. Gordon, Philadelphia Academy of Natural Sciences geologist, just back from an expedition to study America's biggest "shellhole."

About 15 tons of fragments of the meteor, ranging from a few ounces in size to half a ton, have been found in a radius of several miles. Mr. Gordon found that the crater itself, several hundred feet deep, is filled with about 80 feet of sediment. Shells of existing types of water creatures in the sediment indicate that the meteor struck thousands of years ago, when the region was less dry.

Mr. Gordon displayed a hammer head which he forged from meteoric fragments. So tough are nickel-iron alloys of celestial "iron," Mr. Gordon says, that metallurgists got their idea for formulas in battleship armor plate from meteoric material.

A Philadelphia mining company, which owns the meteor crater in Arizona, had hopes of finding tons of pure nickel-iron alloy, but the hole they bought has never disclosed in test drillings any sign of a buried metal mass.

Mr. Gordon will supervise the making of a scale model of the crater for the Academy's exhibitions.

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PHYSICS

Measure Vitamin B_1 By Color Intensity

A NEW method for gauging the quantity of vitamin B_1 in any given food sample is announced by Drs. Gilberto G. Villela and Aluisio M. Leal of the Oswaldo Cruz Institute, Rio de Janeiro, Brazil. (*Science*, Aug. 25)

A water extract is made of the food to be analyzed. The solution is acidified, and ammonium molybdate is added. In the presence of vitamin B_1 an intense blue color blazes up. Gauging the intensity of this color by means of a suitable instrument gives a measure of the quantity of the vitamin present.

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PALEONTOLOGY

Rare Fossil Bird Tracks Just Beyond Museum's Grasp

THE AMERICAN Museum of Natural History is anxious for a group of rare and valuable 25,000,000-year-old bird tracks just beyond reach, as famous Tantalus of ancient Greek mythology thirsted once after a bunch of ever-elusive grapes.

The Museum cannot afford to build scaffolding to reach up, or block and tackle to reach down, to a deposit of tracks found exposed two-thirds the way up a Slim Buttes, S. D., badlands cliff, and the tracks cannot be reached in any other way, Dr. Walter Granger, curator of paleontology, said.

A sample of what is in store for the Museum and its visitors was placed on exhibition. About 100 footprints made by wading birds on the shores of lakes that vanished ages ago are included in specimens picked up at the foot of the cliff by Henry Lee of Rapid City, S. D. They had dropped from a stratum above. Mr. Lee saw more in the stratum. It is these the Museum wants.

"There is nothing much we can do about it except to wait until Mother Nature at her leisure undermines more of the stratum and drops additional blocks to the foot of the cliff for man to discover and that may be a matter of many, many years," Dr. Granger lamented.

"Tracks of dinosaurs left in sandstone and shale are common enough and the tracks of extinct mammals are also found occasionally, but bird tracks preserved in the rocks are rarer than the proverbial hens' teeth."

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